FIREPROOFED WOOD

~~391~~

C. J. H. Woodbury.
Lynn,
Mass.

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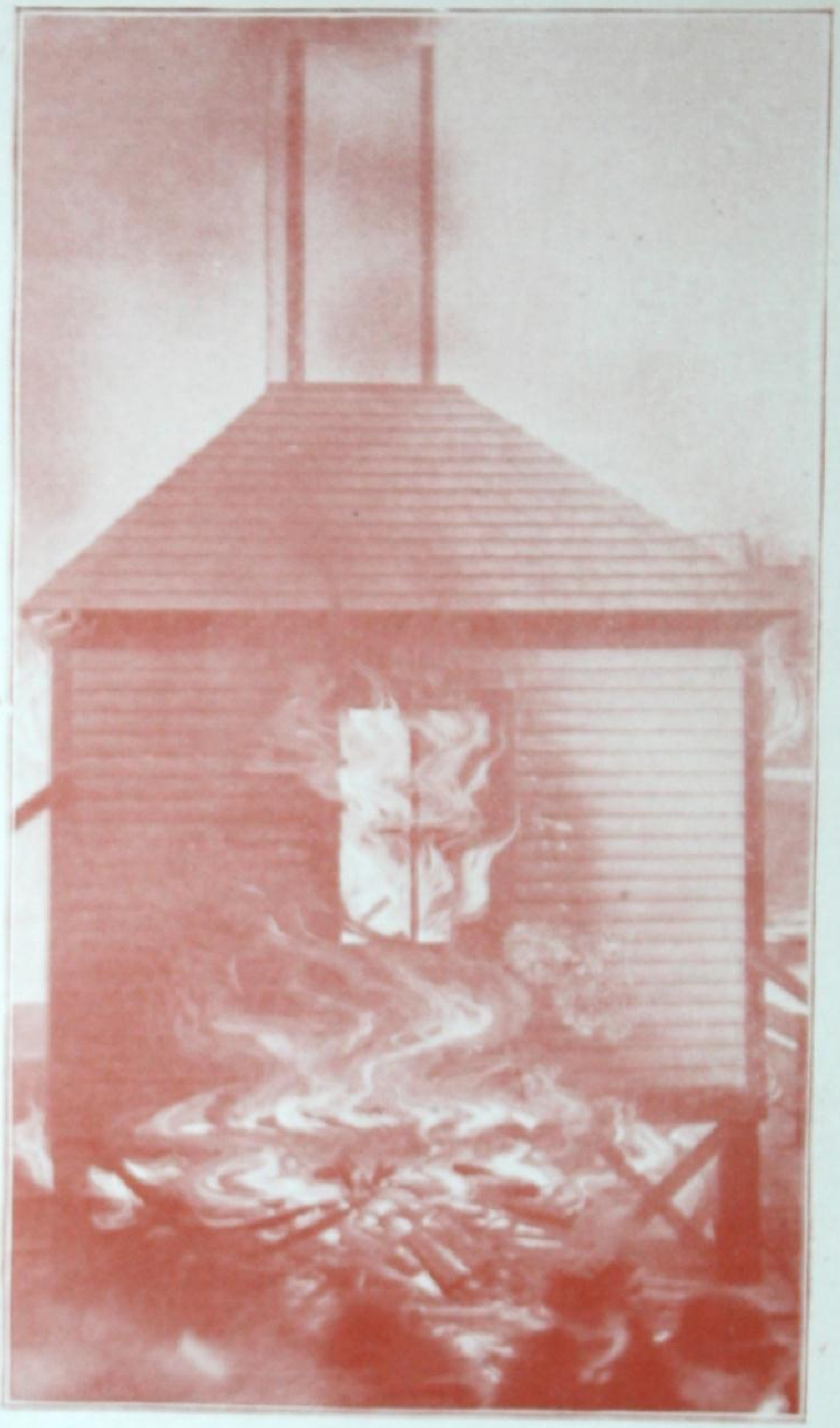

Test, February 23, 1900.

Thirty minutes after the fire was started—when the windows melted.

The Record
of
Fireproofed Wood.

* * *

Tests.
Fireproof
Warships, Etc.

* * *

Second Edition
May 1900

THE ELECTRIC FIREPROOFING CO.,
Geo. C. [illegible], President. Max Bachert, Vice-Pres't. John J. Hughes, Sec'y & Treas.
119 and 121 W. 23d Street, New York, U.S.A.

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The Electric Fireproofing Process is operated by the following companies:

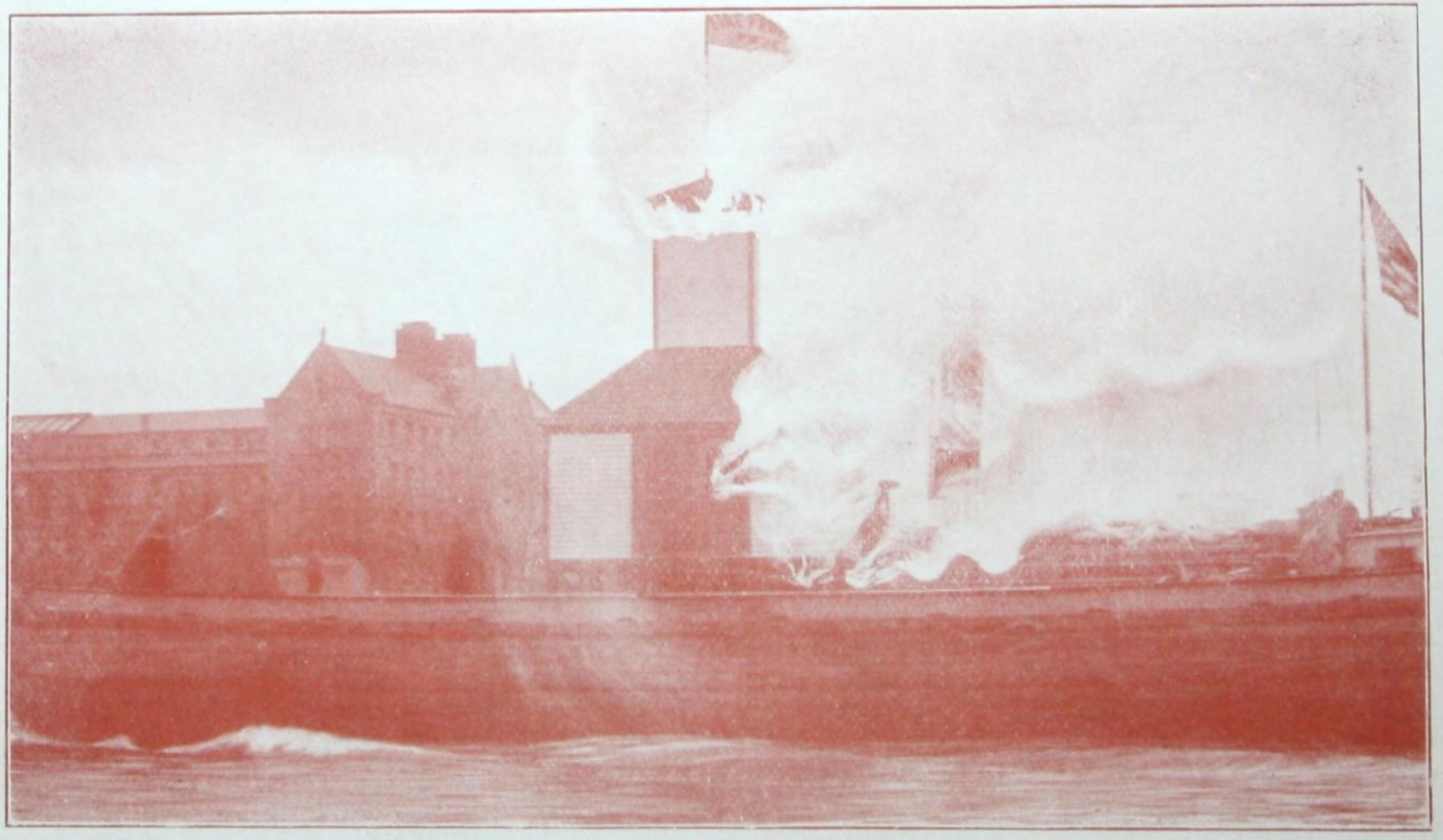
The Electric Fireproofing Company, New York City, N. Y.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va.

The Union Iron Works, San Francisco, Cal.

The Electric Fireproofing Company of Canada, Limited, Montreal, Can., and its subsidiary companies throughout the Dominion of Canada.

The British Non-Flammable Wood Company, Limited, of London, and its subsidiary companies throughout Great Britain and the European Continent.



Test, February 23, 1900.

Ten minutes after the fire commenced.

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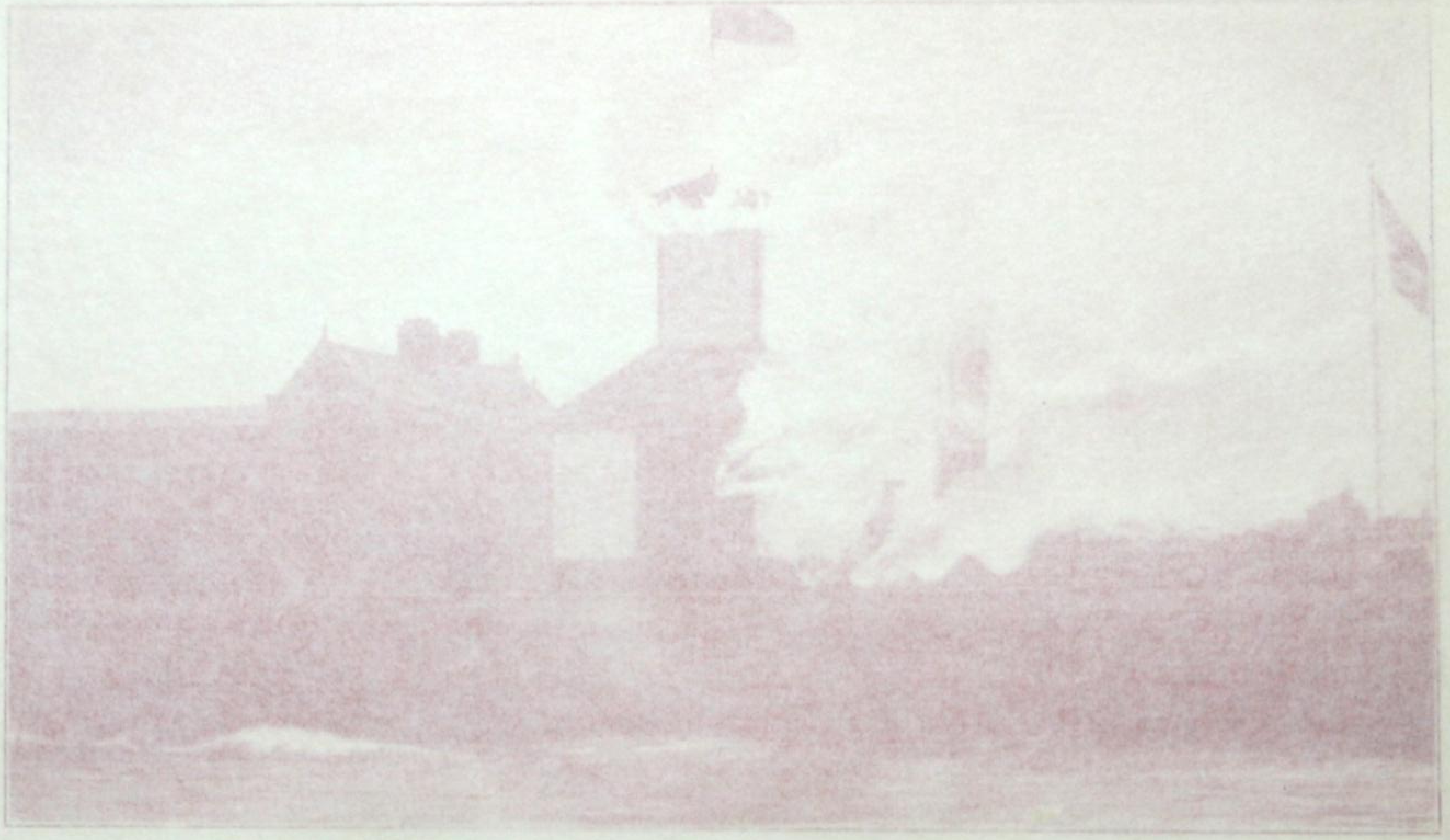

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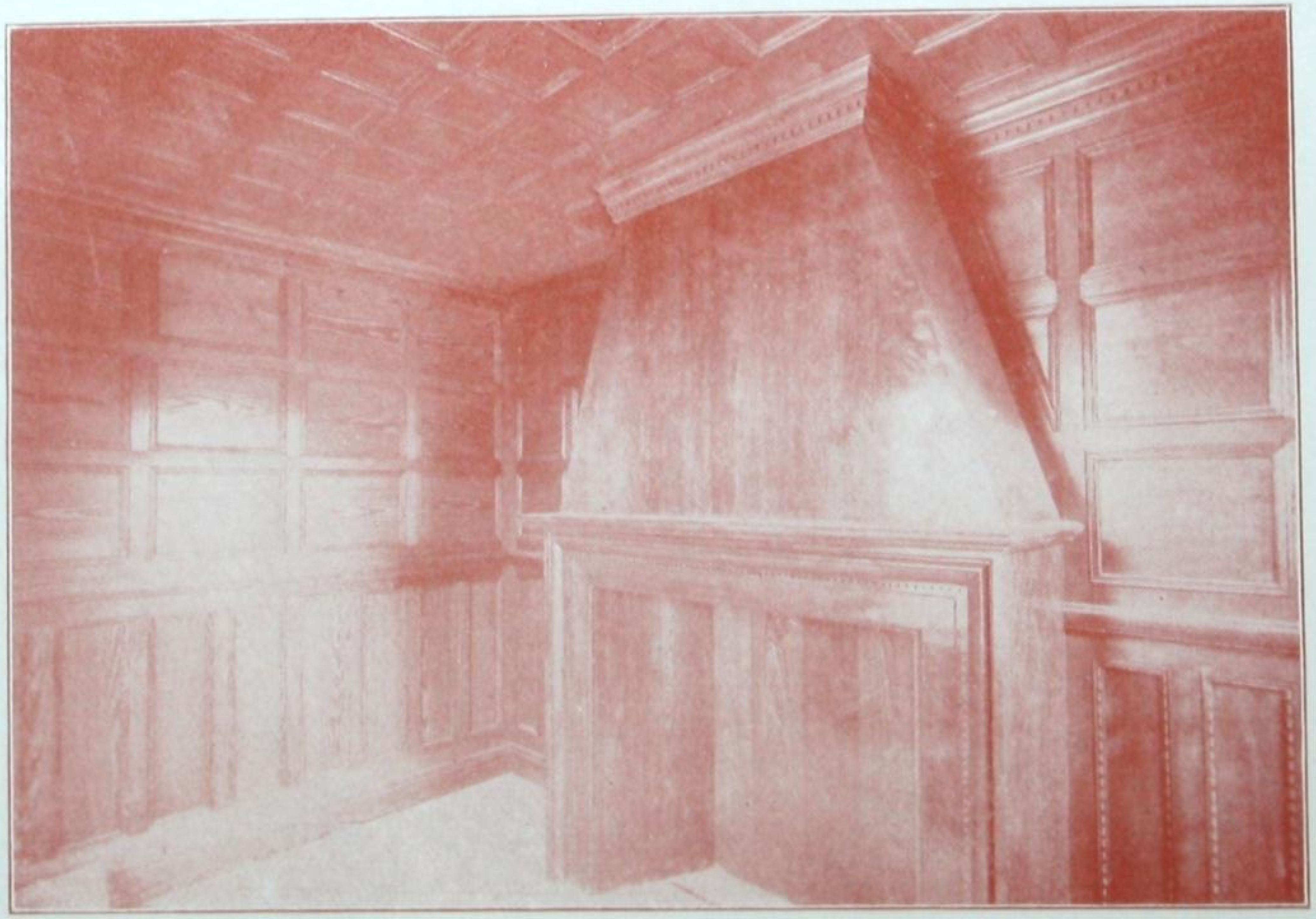

Fire Test of Electric Fireproofed Wood in New York, February 23, 1900.
Interior view of house before the fire.

PREFACE.

THE following pages contain a plain record of Electric fire-proofed wood from the first public test of January 5th, 1895, to the present one of February 23d, 1900.

This record cannot fail to prove interesting to all who consider building construction from the point of public safety, combined with ornamental effect and economy, whether it be in the erection of homes, schools, theaters, hotels, or ships for war or pleasure.

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The Record
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Fireproofed Wood

CIVILIZATION demands the existence of cities and towns as centers of society and commerce ; it is therefore natural that every means should be sought by which the home, the factory, the warehouse or the store should be rendered secure against that most terrible of all destructive agents—FIRE!

Fire, as a friend to mankind, is indispensable, but as an enemy its terrible potency is dreaded by all. It will steal upon us unawares, by night or day, and, unchecked, will rob us of our possessions and even our lives. One little spark is sufficient to start a conflagration which will reduce a great city to ashes, if the buildings are constructed of combustible material.

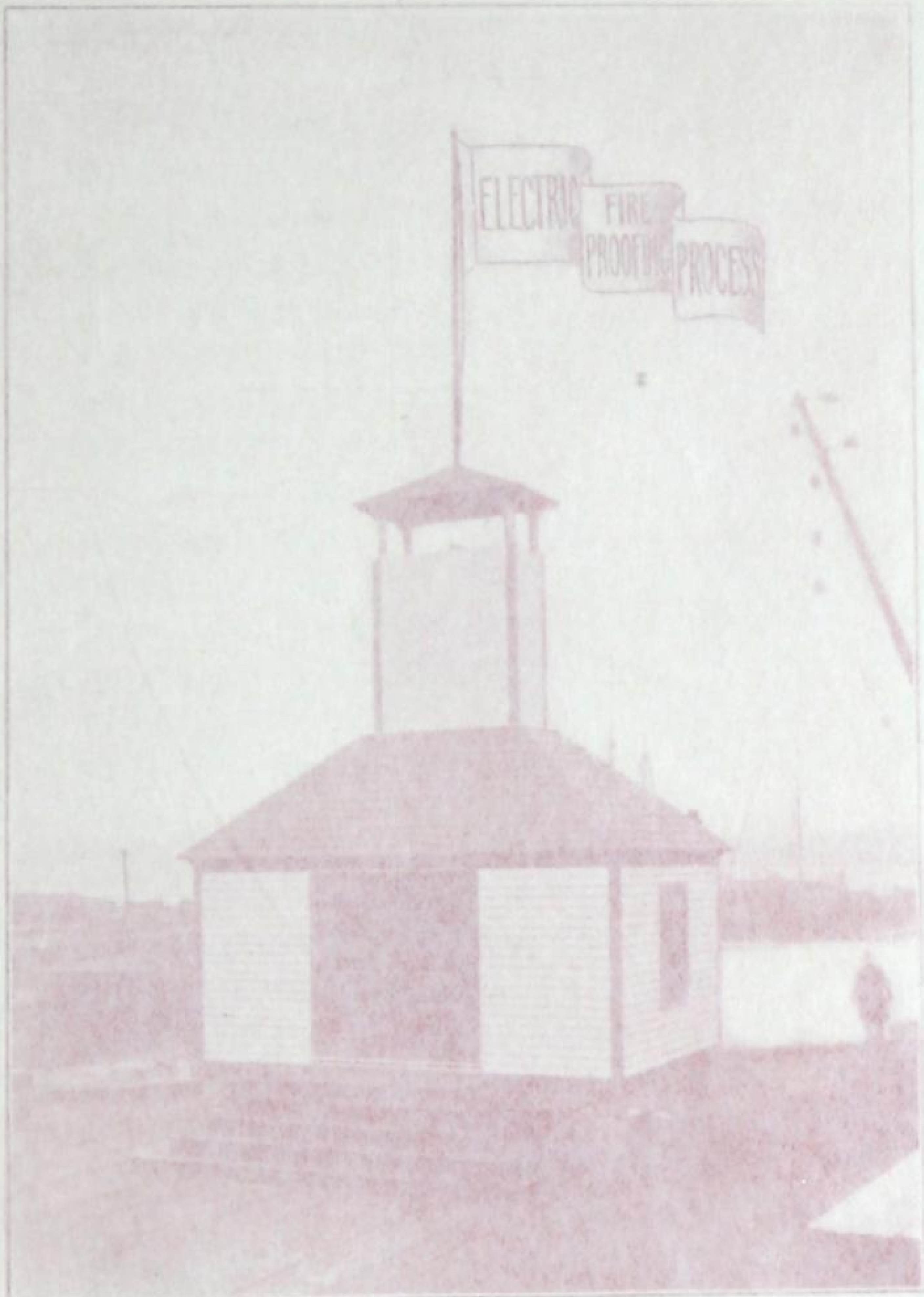
A Natural Building Material

Wood appears to be the natural building material of most countries, and the record of the disastrous conflagrations of towns and cities in the world's history is but indisputable evidence of its combustibility, whether the holocaust of flame has occurred in Rome, Paris, London, Chicago or New York.

When the modern skyscraper is built, the materials which enter conspicuously into its construction are stone, steel, brick, terra-cotta and cement. These materials are used because they are considered incombustible, and absolutely impervious to flame. Very little woodwork is to be seen in these buildings, and architects who have an eye for the beautiful have been known to declare them to be cold and comfortless.

However, without referring to the ornamental effect within and without the modern "fireproof" building, we can say without fear of contradiction that they are exceedingly costly, and only the very rich can indulge in their construction. Space is very limited, and the tenant inconveniences himself and his family if it be an hotel or apartment building, and willingly pays the piper for the supposed protection the "fireproof" building affords.

But these tall and stately structures of steel and stone are sometimes found to be not quite fireproof after all. Defective installation of electric wires or the overheating of a furnace, or firing of a flue, and the mischief is started. Whatever is combustible within reach burns, and sometimes the temperature is reached which warps the steel framework of the building and breaks up the marble stairways and walls, and if the fire department does not succeed in checking the flames in time, the structure collapses and becomes a heap of ruins.



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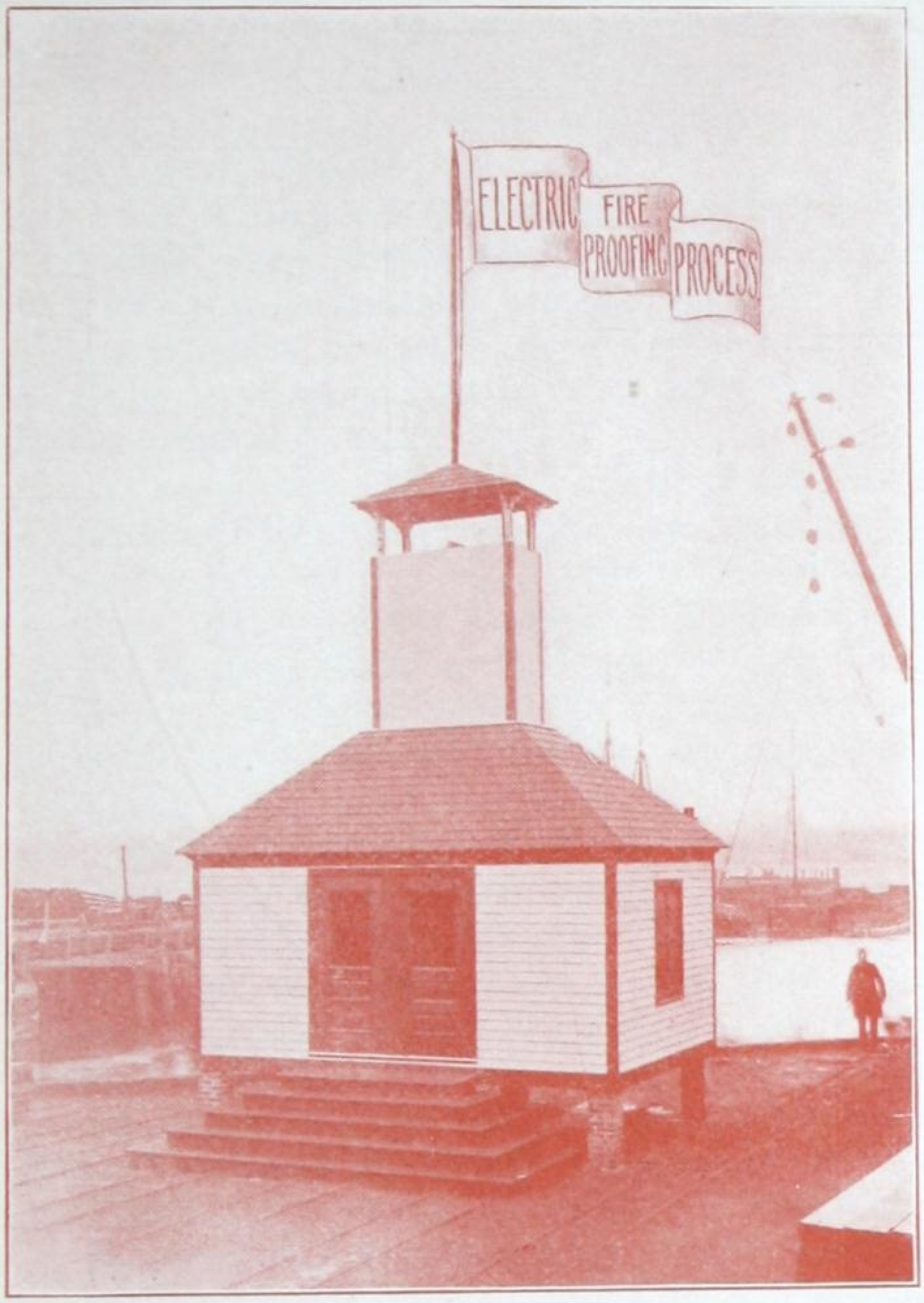


The Test of Electric Fireproofed Wood in New York, February 23, 1900.

Exterior view of house before the fire.

To Supply the Need

Centuries ago it was declared that if wood could only be rendered proof against flames it would be the ideal building material of civilization. The supply is inexhaustible, and its variety and beauty is practically unlimited.

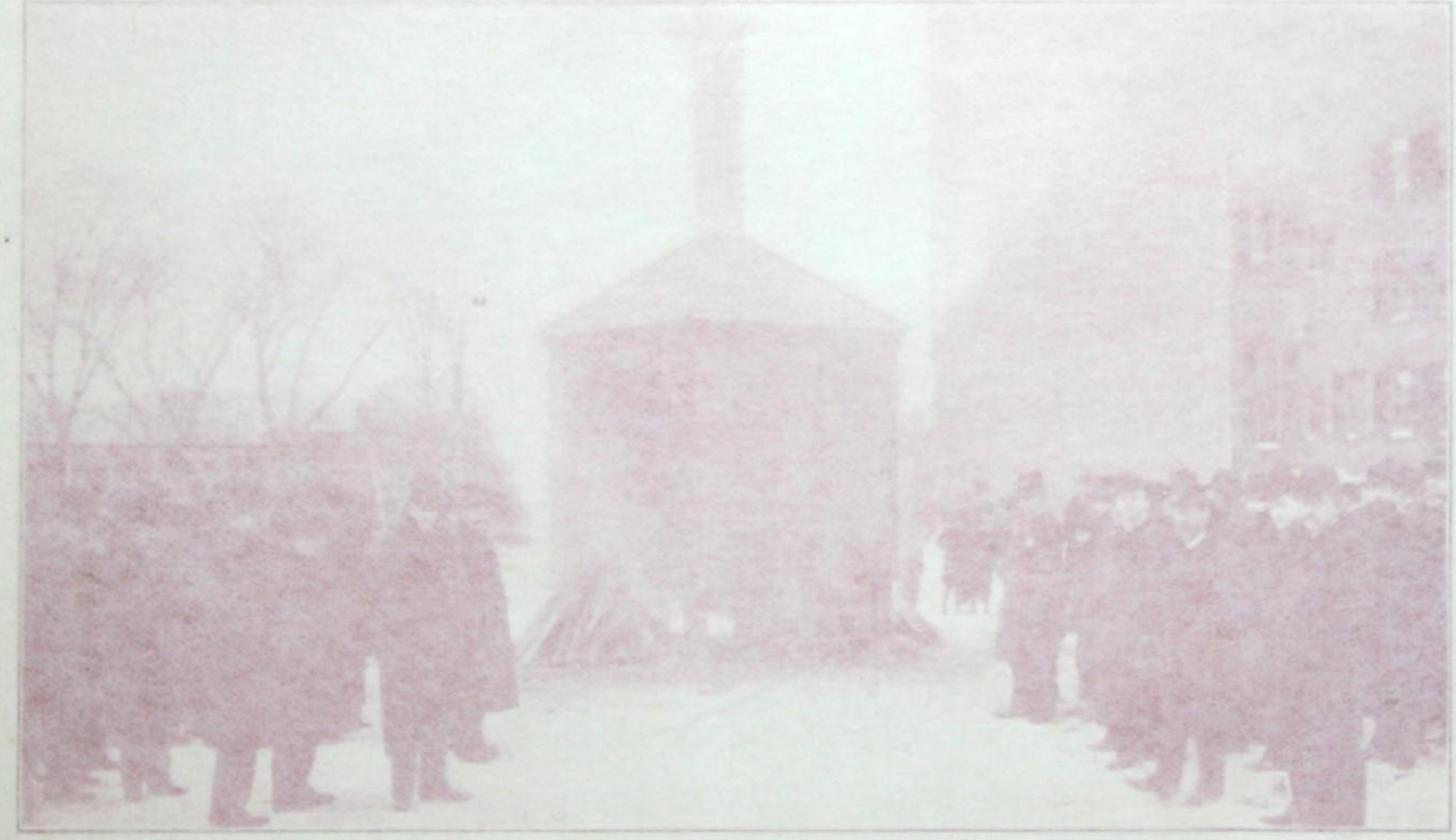
For ornament or comfort it is more desirable than stone, and the comparatively poor man can build himself a dwelling of wood when he could barely afford to purchase a single room in a modern fireproof apartment house.

The forests of the world have been searched time and again for unburnable wood, but all in vain. Neither the redwood from the primeval forests of Australia nor the ironwoods from Arizona, or the West Indies, or China, although often advertised as fireproof, have proved to be uninflammable.

In this dilemma men of science have sought to impregnate wood with chemical substances which would render it impervious to flames. Up to the year 1870, however, the success achieved in this direction was but meager, and even in this shadow of a possibility it was discovered that some of the chemicals used rotted the fibers of the wood. Moreover, it was found that enormous hydrostatic pressure, which had been ignorantly applied in forcing the solutions into the wood, caused its collapse. Pretenders were many and various, as they are today, and practical men—builders, architects, fire underwriters and capitalists—became weary of the schemers who promised the desired fireproof wood and never produced it. Naturally their patience became somewhat exhausted, and when the honest inventor who had discovered nature's secret came, his claims likewise were received with prejudice until he had demonstrated the fact that wood could be transformed and made absolutely incombustible.

The Electric process, which makes the seemingly impossible thing possible, by rendering the most combustible wood *incombustible* is, like all great and useful inventions, the result of years of indefatigable labor and unlimited expenditure, but the inventor of this process was aiming in the right direction from the commencement of his experiments until he had achieved a triumph.

Considering the immense demand for Electric fireproofed wood at the present time and the vast importance it has assumed, it may not be surprising if, from time to time, promoters are found who will attempt to foist worthless methods upon the public. This is an everyday occurrence in other channels of less magnitude and will probably occur in this.



First Test of Electric Fireproofed Wood in New York, January 5, 1895.

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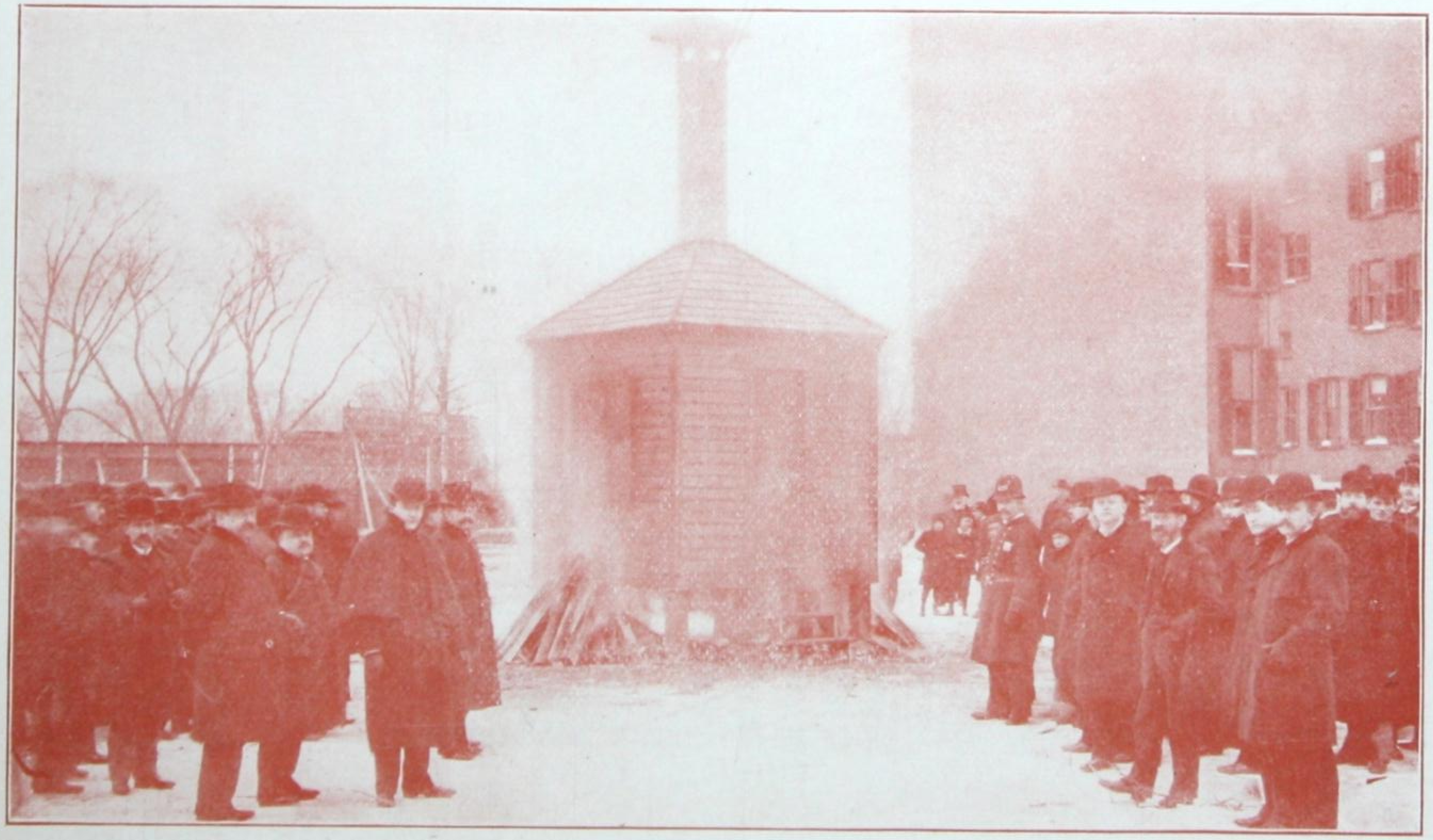


First Test of Electric Fireproofed Wood in New York, January 5, 1895.

Tests of the Electric Process

The First Test in New York

THE first public demonstration of the effectiveness of the Electric process was given on Saturday, the 5th of January, 1895, in New York, in the presence of the officials of the building and fire departments of the city. Many prominent gentlemen interested in building construction, from New York and surrounding cities, witnessed this extraordinary proof of the certainty of the Electric process. All the newspapers of the city the following day devoted considerable space to the test. The New York Herald, however, appears to give the clearest account of it, as follows :—

Fired in the Cause of Science

> Quite a curious scene took place yesterday afternoon in a vacant lot on the northeast corner of Broadway and Fifty-ninth street. It was a fire, and a very likely one, which lasted for about an hour and a half.
>
> One of the curious things about it was that those whose business it was to protect the city from fire were there to authorize the "conflagration." The Fire Department and the Building

Department were represented, and the representatives aided and abetted in the burning of the building.

It was merely an experimental fire to try the virtues of a chemical preparation for the saturation of wood in order to render the wood nonflammable.

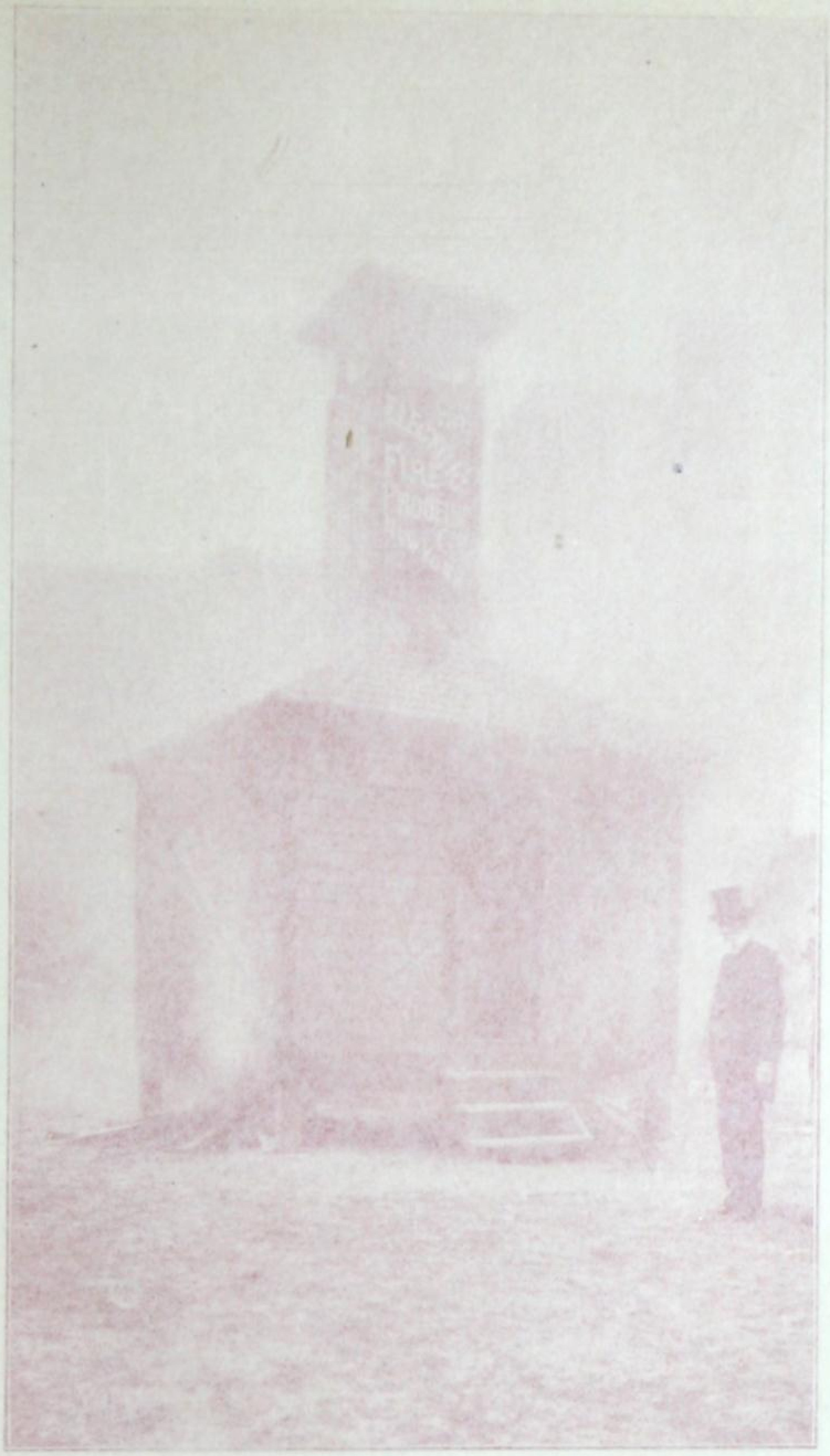
Permission was obtained from the Fire Commissioners to try the experiment. Among those who came to see it were Superintendent Brady, of the Building Department; Fire Chief Bonner, Mr. Anderson, Superintendent of Fire Underwriters; Colonel Jackson, of the United States Mail Service; Superintendent Reasmer, of the Delaware & Lackawanna Railroad; David Young, of the New Jersey Traction Company, and representatives of the New York Central and of the New York & New Haven, and of the Pullman companies, and J. Charles Davis, of the Fifth Avenue Theater, and representatives of Philadelphia's Committee of Public Safety.

In the center of the lot was built a frame house about 6 by 6 feet and 7.6 feet high, with a shingle roof. It was supported at the corners by wooden pillars 2 feet 6 inches high. There were two windows, with shutters, and a door. In its construction were used pitch pine, ash, oak, white wood, yellow pine and various kinds of hard wood.

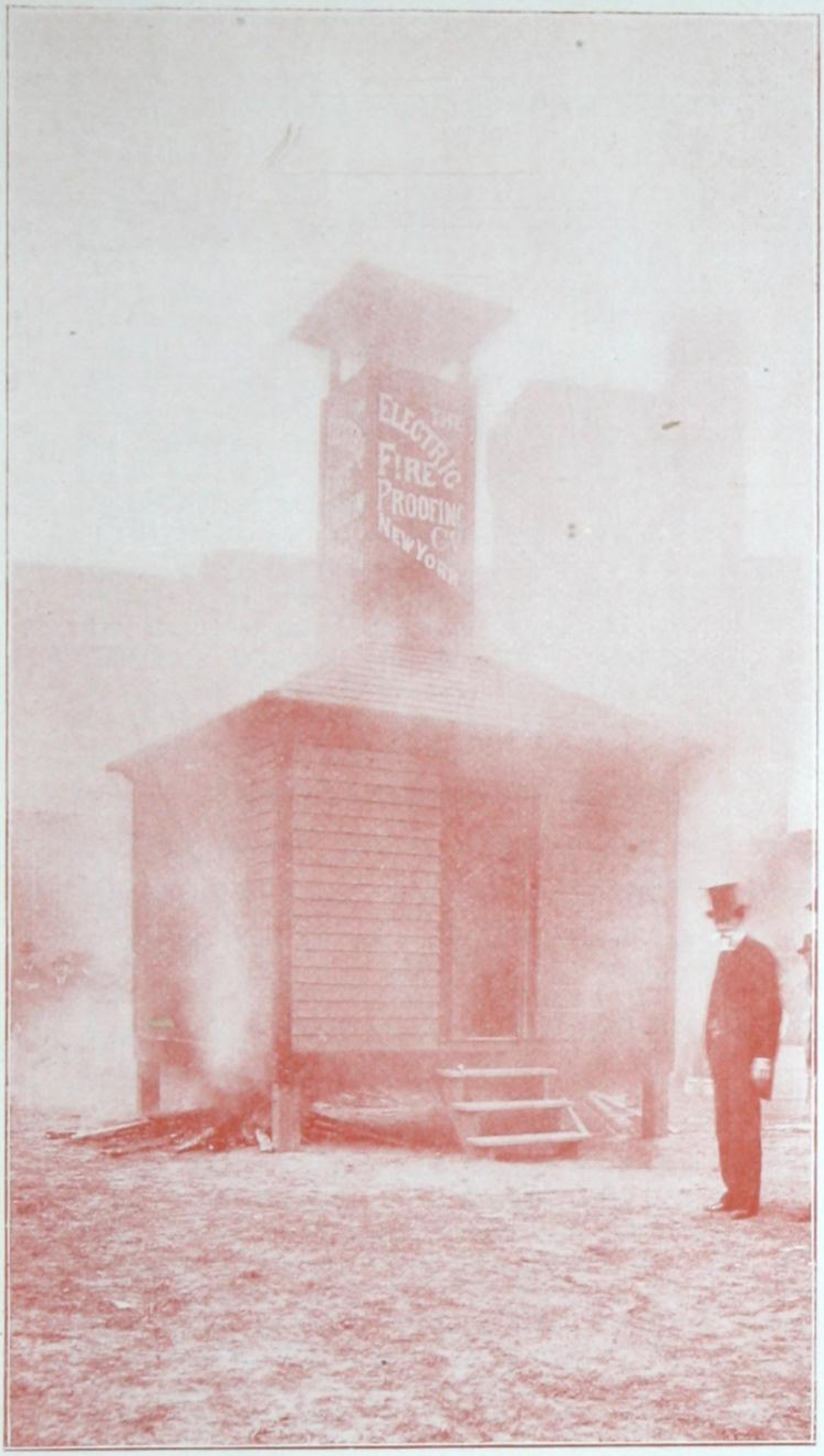
On two sides were piled logs of wood saturated with petroleum. In the middle of the house was another pile of wood, also saturated with petroleum. Then the logs, inside and outside, were set blazing; the flames licked the boards, which were only three-quarters of an inch thick. The heat became intense.

A five-foot draw chimney sucked up the flames from the interior. This continued for one hour and fifteen minutes, and then the structure crumbled. The uncharred boards were almost cold to the hand. The firemen who were there with an engine said that under ordinary circumstances the house would have been consumed in five minutes.

It is also worthy of note that that very conservative sheet, the Journal of Commerce and Commercial Bulletin of January



Test of Electric Fireproofed Wood in Boston, May 4, 1895.
One hour and ten minutes after the fire was started.



Test of Electric Fireproofed Wood in Boston, May 4, 1895.
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7, 1895, noticed the occurrence briefly, as follows:—

> A frame house was erected upon a vacant lot in Broadway, near Fifty-ninth street, and filled with pitch pine shavings and kerosene oil, the wood in the structure having been treated with the process, which consists of the application and impregnation of certain chemical substances. The fire was started by igniting a half cord of wood saturated with kerosene placed beneath the building, and the blaze burned fiercely for over an hour without visible effect upon the processed structure.
>
> The nails and iron work of the building melted long before the wood showed any sign of weakness. The many experts present pronounced the test the severest ever attempted for a fireproofing process and the most satisfactory, it being apparent that no ordinary building in burning is ever subjected to one-tenth of the heat developed in this test.

Demonstration at Boston

The next public demonstration was given at Boston, Mass., on Saturday, May 4, 1895, and caused as great a sensation as did the one in New York. The Boston Journal of May 5, 1895, describes it in the following article:—

Really Fireproof

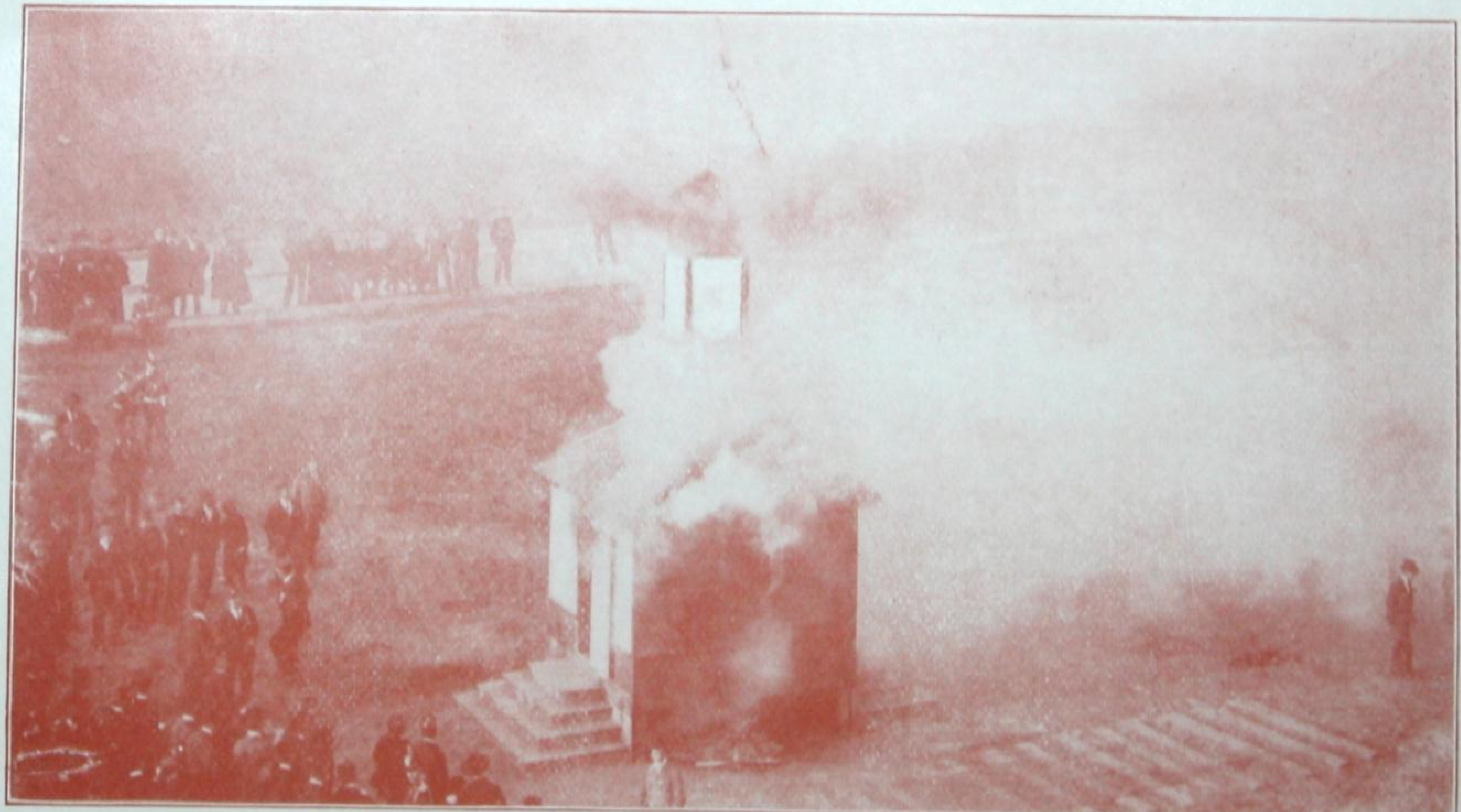
> No other such completely successful exhibition of the qualities of a fireproofing process was ever made in Boston as that on Berkeley Oval, Irvington Street, Saturday afternoon. The exhibition was given by the Electric Fireproofing Company, of New York. Five hundred people were inside the oval bounds, and in the armory, the houses on Irvington street and on the adjacent fences were 500 more. Prominent among the spectators were Fire Commissioners Fitch and Innis, Chief Webber, ex-Chief Damrell, now Chief Inspector of Buildings, Mr. F. E. Cabot, superintendent of the Boston Board of Fire Un-

derwriters, Mr. Edward Atkinson, President of the Manufacturers' Fire Insurance Company; the United States Postal Commission, the United Electric Light Company, and the Bell Telephone Company, and many eminent Boston architects.

The house constructed for the experiment was about 15 feet square by 30 feet in height. It was subjected to the severest test possible under the personal direction of Superintendent Cabot, who caused a pile of shavings and pine logs saturated by kerosene oil to be built up from the ground on each side of the building, and a large amount of combustible material to be piled high on the floor in the center. These fires burned for about a half an hour, at times almost completely enveloping the building in flames. Tongues of flame shot out of the door, through the windows and out of the top of the tall chimney, and it was the opinion of all present, except the inventors, that the structure would be destroyed, but such was by no means the case, as after the building had been a literal fiery furnace for an hour and forty minutes, the combustible material in and around it was entirely consumed, leaving the building apparently uninjured, with the exception of the carbonizing of its interior and the blackening of its sides and top. . . . . The glass in the windows was melted and ran down in shapeless lumps. Some of it was carried away as souvenirs.

The officials present, almost without exception, congratulated Vice-President Max Bachert, of the Electric Company, on the success of the test, and admitted that it was almost unnecessarily severe. Mr. Henry W. Savage, a prominent real estate operator, said that, at last, it is possible to make a building fireproof in every way, and requested permission to walk over this floor that withstood a fire so severe. He is of the opinion that this will immediately attract the attention of the government, and perhaps be used in naval construction.

Mr. Winslow, of Winslow & Wetherell, architects, said that the test was the best he ever saw, and that stone or iron would have crumbled under the intense heat. Captain Damrell allowed that the heat undoubtedly registered over 2,200,



The Test of Electric Fireproofed Wood at Atlanta, Ga., December 7, 1895.
Fifty minutes after the fire was started.

and that, as iron fused at 1,900, an iron building would have melted away long before the heat reached that degree. Commissioner Fitch expressed himself as highly delighted with the test, saying that it conclusively proved the efficacy of the process.

Chief Webber said that the best fireproof building now known would, in the same circumstances, have been entirely consumed in less than one-quarter of the time.

The following extracts from other reports of the test are quoted chiefly for their expressions of opinion:—

From the Boston Globe, May 5, 1895.

"Captain Damrell estimated that the heat on the inside of the building, generated by two roaring fires underneath and the mass of burning material on the floor, would register not less than 2,000 degrees.

"'Why,' said the captain, 'iron fuses at 1,900 deg. An iron floor would have melted and dropped to the ground long ago.'"

"But the wooden floor continued to resist the flames until members of the committee, apparently exasperated by the stubborn stand this frail wooden structure maintained against all attempts to burn it, opened the door and hurled a couple of gallons of kerosene into and on the burning pile.

"In an instant the flames burst from the doors and windows, enveloped the entire interior and shot out of the chimney, while great clouds of black smoke rolled up and obscured the afternoon sun.

"It was the opinion of every one present, excepting the Electric company's representatives, that the building was doomed, but this fire raged without a check until the glass in the windows was melted, and every bit of the combustible material, both inside and outside, was consumed, when the building was seen standing almost uninjured.

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"Chairman Fitch, of the Fire Commission, said that the test had conclusively proved everything the owners claimed for their process, while Chief Webber, of the Boston Fire Department, said that the best fireproof building known would have been entirely consumed in less than a quarter of the time.

"Mr. Winslow, of Winslow & Wetherell, the architects, said the test was the best he ever saw, conclusively proving that it was possible to make wood indestructible by fire; while Mr. Hichborn, of the Boston Navy Yard, said that the test was in every way satisfactory, and would undoubtedly attract the attention and be approved of by the government.

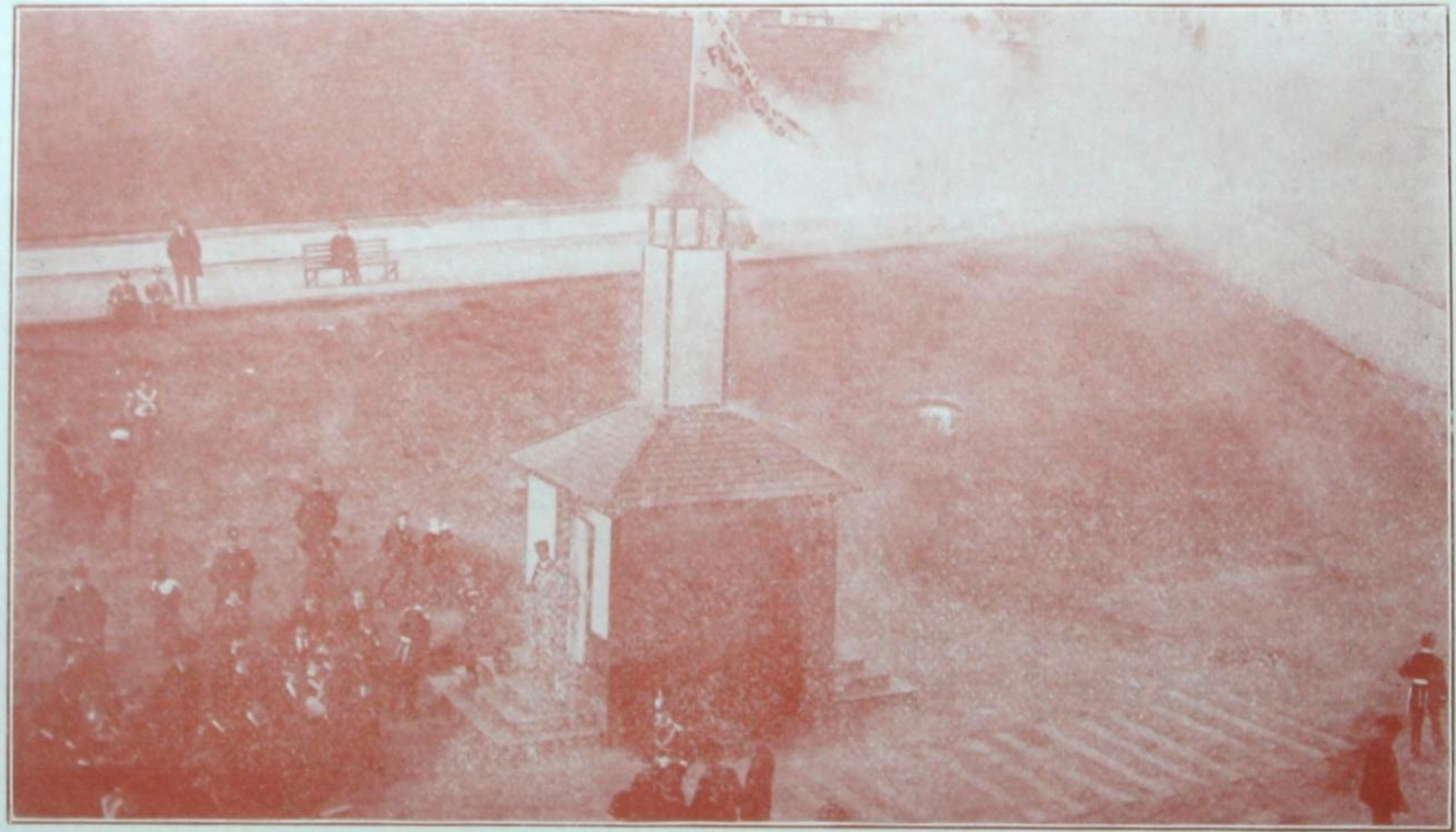
"Superintendent Cabot did not hesitate to assure those present that it was a most unqualified victory. It was the opinion of nearly everyone present that the test was unnecessarily severe, but the victory was, of course, all the greater for the exhibitors."

From the Boston Daily Post, May 5, 1895.

"The result was regarded in every way satisfactory, and the members of the company present were openly and heartily congratulated by the officials and others who came in a professional capacity to witness the test. It was found that where the blaze had been the hottest the wood was charred through, but had not ignited, and outside of the small space where the concentration of the flame had produced this result, the building was not in any way affected. The glass in the two windows had been melted, but the sashes had not burned. They were of the nature of charcoal, but had not given way or shown any sign of breaking out into a blaze."

From the Boston Evening Transcript, May 13, 1895.

"The Electric Fireproofing Company, which won such unqualified victory by the recent fire-test of the little fireproof wooden building on Irvington Oval, has been prompted to give the building, which remains almost uninjured, to the Boston Athletic Association in return for the many courtesies extended to the company in the past week. It is gratifying to the members of the company to think that this wooden building is



The Test of Electric Fireproofed Wood at Atlanta, Ga., December 7, 1895.
One hour and ten minutes after the fire was started.

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Test at Atlanta, Ga.

The next public demonstration of the Electric process for fireproofing wood was made at Atlanta, Ga., December 8, 1895, at the request of many officials of the Building and Fire departments in the state. A house, entirely of wood, was built in strict accordance with their wishes. Very dry pieces of highly inflammable wood were piled high both inside and outside of the building; kerosene was poured over this, and very quickly the fire raged so hot and furiously that the great crowd of people which had assembled were compelled to move a considerable distance away. The Atlanta *Constitution* of December 9th said the people were "amazed," and concluded its report of the test as follows:—

"The flames shot up and licked against the sides of the house in vain. Hotter and hotter it grew. The wood began to char somewhat and became transparent with the [illegible], but it would not ignite. The people yelled. The report had gone out that one of the big log buildings was aflame, and the crowd ran wildly down in the direction of the manufacturers' hall.

"The fire under the building still burned, but with no effect. Another trial would be made. In the middle of the room were shavings and all manner of combustible material. This was saturated with oil and pine wood heaped on. Chief Joyner this time struck the match and applied it to the pile. The blaze shot up through the chimney and the draught blew it up with terrific force. The wooden chimney spouted like a blast furnace, but in no place would the building ignite.

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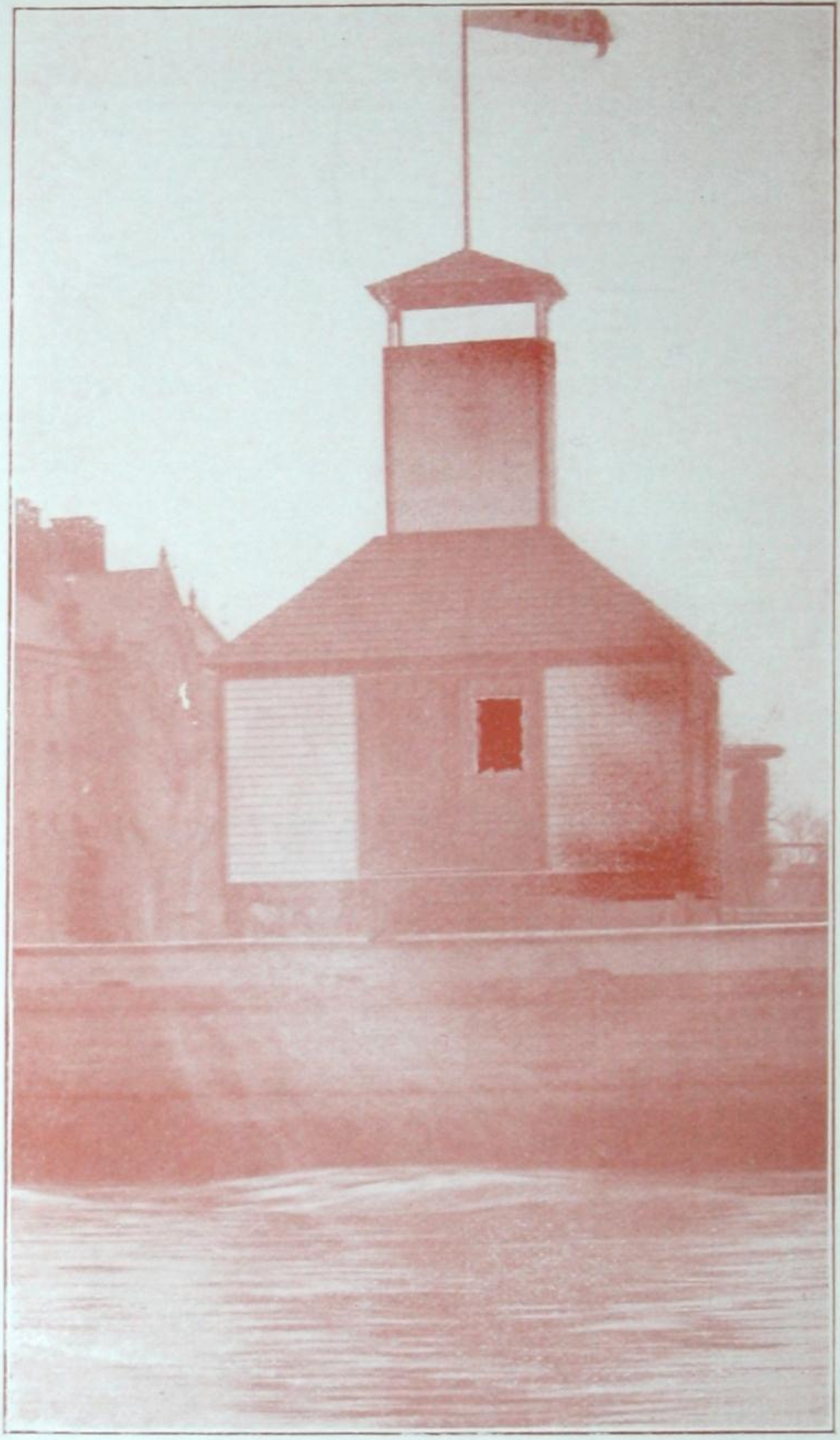
"The flames shot up and licked against the sides of the house in vain. Hotter and hotter it grew. The wood began to char somewhat and became transparent with the incandescence, but it would not ignite. The people yelled. The report had gone out that one of the big log buildings was aflame, and the crowd ran wildly down in the direction of the manufacturers' hall.

"The fire under the building still burned, but with no effect. Another trial would be made. In the middle of the room were shavings and all manner of combustible material. This was saturated with oil and pine wood heaped on. Chief Joyner this time struck the match and applied it to the pile. The blaze shot up through the chimney and the draught blew it up with terrific force. The wooden chimney spouted like a blast furnace, but in no place would the building ignite.

The fires burned for an hour and finally burned themselves out. The embers were extinguished and Mr. Tupper, Chief Joyner, and several members of the Southeastern Tariff Association stepped up to examine the result. The sides of the house were black and carbonated, but in no place had the fire caught. The planks were charred the fraction of an inch. No damage was done. The glass in the windows had melted and the molten fluid trickled down on the window sills, which were still intact. It was a severe and marvelous test."

From the Atlanta Journal, Dec. 9, 1895.

"But for the blistering of the paint on the sides and the blackening of the interior, it would do for another test, although it had withstood the fiercest fire possible for an hour and forty minutes. Several bystanders remarked that it was a veritable crucible, and marveled that the frail board on the top of the chimney stood this smelting furnace fire for so long a time and yet remained apparently intact."



Test, February 23, 1900.

THE HOUSE THE DAY AFTER THE FIRE.

"The fire raged for over an hour and a half, inside and outside, and was a veritable roaring furnace."

The Latest Test of 1900

THE perfection to which the Electric process of fireproofing wood has been brought was demonstrated on the 23d of February last in a special manner.

A house, which had been built entirely of wood rendered non-inflammable by this method, was crucially tested for the satisfaction of the officials of the New York Building Department, and other gentlemen interested in building construction.

In order that the permanency of the fireproofing might be adequately proved, only wood which had been treated several years before was selected for this test. This wood was of various kinds and represented what is used in the highest class of modern buildings.

The house consisted of two large rooms, having an unusually wide chimney in the center of the dividing wall. One of these rooms was elaborately finished with carved and polished hardwood panels in wall and ceiling. There was an open fireplace, with carved mantel and polished wooden hearth. Altogether the apartment was a

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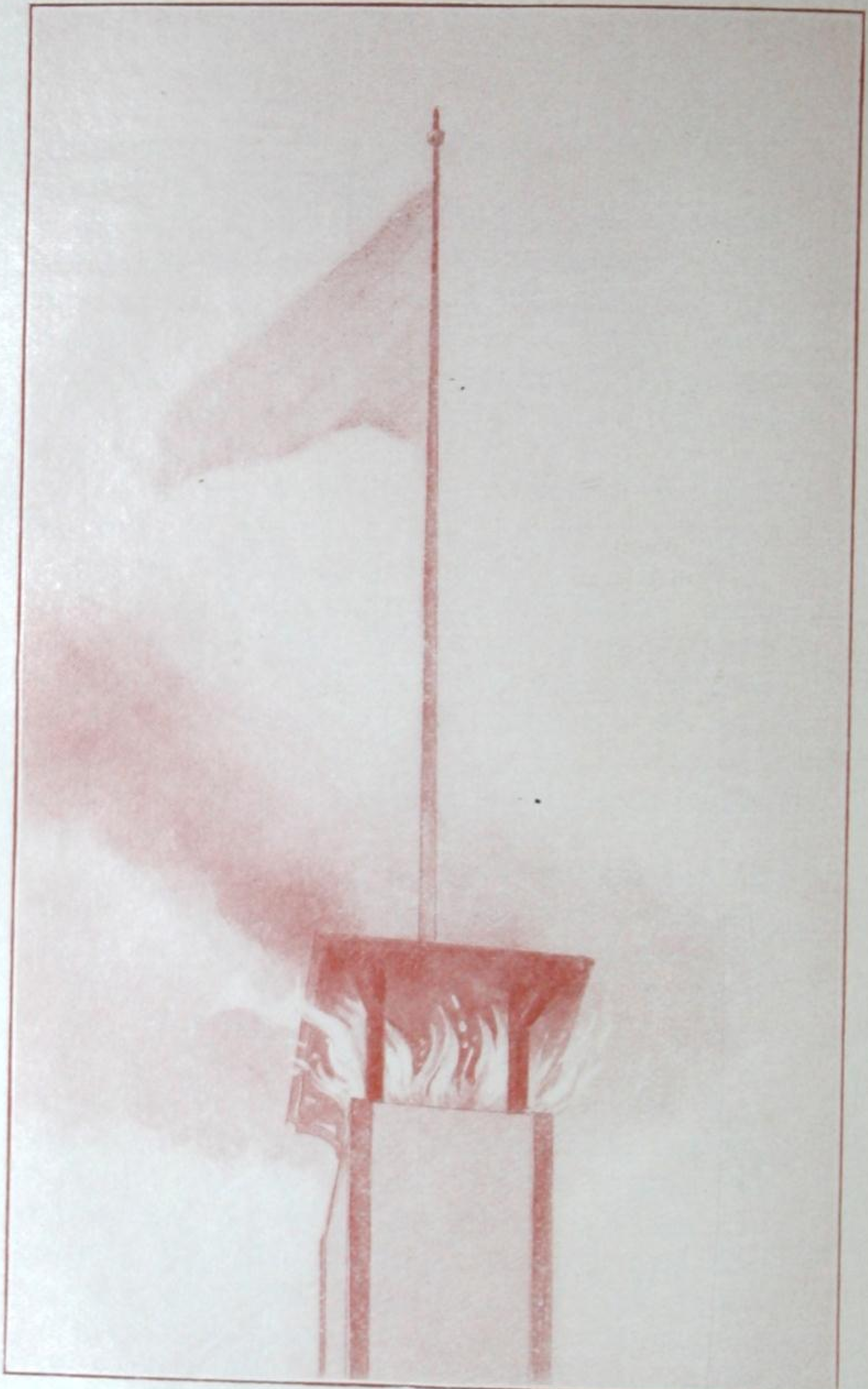
A prominent official who was present declared that it was a pity to destroy such a beautifully finished room, but the inventor of the process could only reply that the test "must be thorough in order to demonstrate the possibilities of the treatment."

No efforts were spared to make the test severe. A great quantity of dry logs was piled up within and without the building, and over all this many gallons of kerosene oil were poured. When the flames gave signs of diminishing their intensity still more wood was piled up and more oil was poured on, and the flames shot outward and upward and roared as only a veritable furnace can roar.

The trial proved to be a revelation to the skeptical, and expressions of astonishment and admiration were numerous and emphatic. After an hour and a half, when the flames had died out, the house was standing defiantly, unimpaired in structural solidity, and the admired dining-room interior was indisputably intact.

The only signs the structure showed of having passed through such a terrible ordeal was the partial charring and the smoke, and the blistering of the paint where the flames had used their best endeavors to demolish everything they touched.

At this juncture the Building Commissioners surrounded the structure and made a close inspection of the interior and exterior, and expressed themselves in un-



"To me the central point of the test is there," said Mr. Kingsland, the expert representing the New York Board of Fire Underwriters, as he pointed to the chimney cap, "the flames have been underneath all the time, but it has only carbonized." —*The Insurance Press*, February 28, 1900.

measured terms of approval of the fire-retardent and non-inflammable qualities of the wood.

As an illustration of the perfect condition of the elaborate dining-room after the conclusion of the test, the house was purchased by a gentleman present as an addition to his summer residence on Long Island, which speaks volumes for the effectiveness of this useful invention.

The newspapers representing insurance and building interests described this test with various degrees of justice, but all were more or less enthusiastic regarding the merits of the Electric fireproofing process.

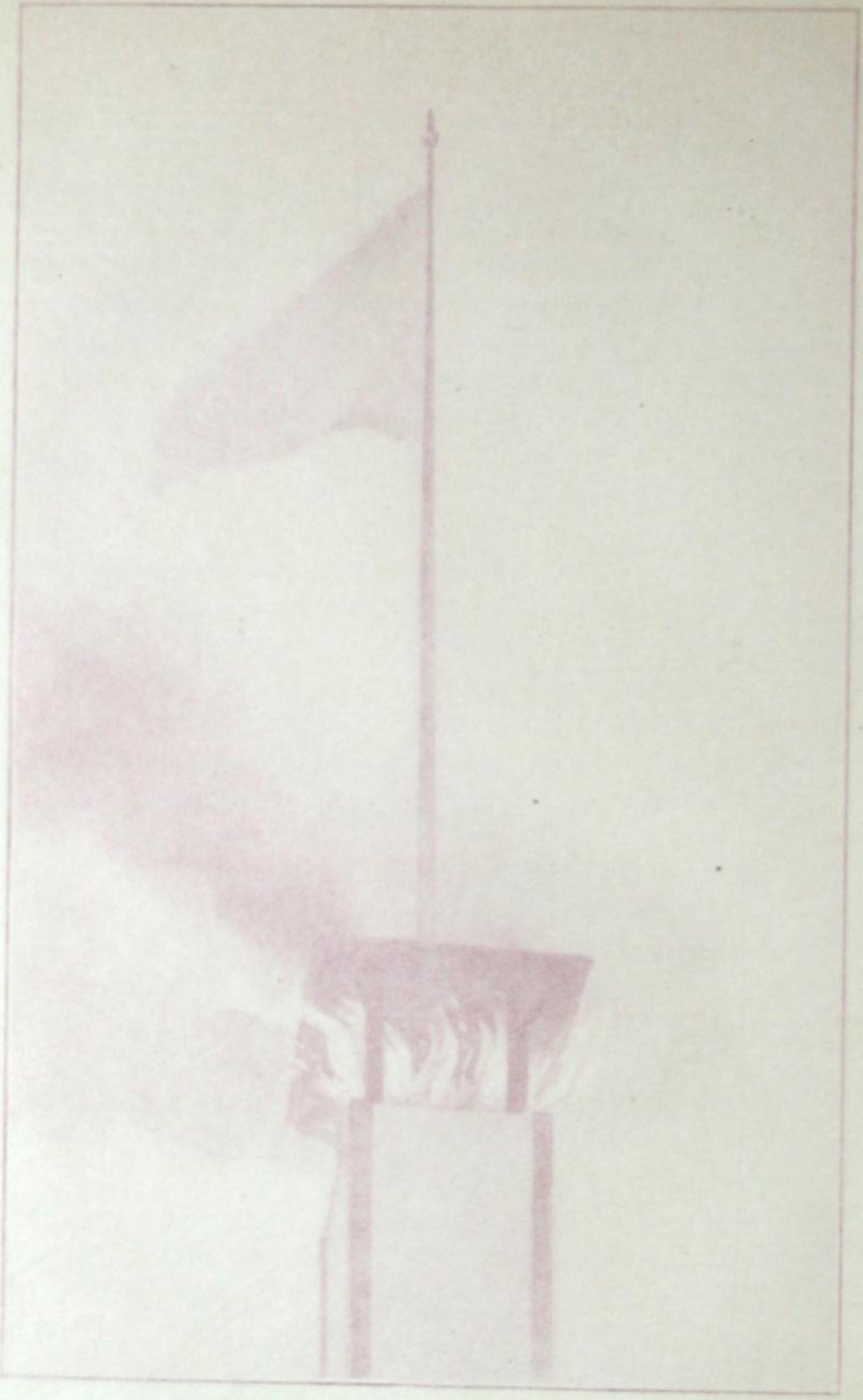
We have selected the following extracts from newspaper reports of the test because they are fairly exact, and our space is too limited to quote all—

New Building Material

It is doubtful whether the new building material—fireproofed wood—has ever before been subjected to so severe a test as the one on Friday last on the East River.

If the fire retardancy or non-inflammable qualities of Electric fireproofed wood were ever doubted by any of the onlookers before witnessing this test, it is safe to say that no doubt could have remained in the mind of any sane person who observed the manner in which the treated wood resisted flames, which could not have registered less than 1,800 degrees Fahrenheit. Nails, screws, hinges and glass were melted, while the wood merely charred on the surface.

A house of two rooms and a wide chimney had been specially designed and constructed to meet the requirements of the officials of the New York Building Department, who were desirous of investigating in a thorough manner the possibilities of wood treated by the electric process.



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Pains Taken to Make a Hot Fire.

A great heap of dry Virginia pine logs was piled up over shavings and kindling wood in one of the rooms, while underneath the building, which stood on wooden posts about three feet high, was another pile of logs carefully arranged to burn. In order to make the fire burn fiercely and swiftly and the heat intense, many gallons of kerosene were poured over the logs and shavings.

At eighteen minutes past 4 o'clock the fire beneath the building was started by Commissioner Brady, and very soon the roaring flames were madly endeavoring to demolish the structure of treated wood.

"Pile on the wood!" shouted Max Bachert, the inventor of the process, to his employees, and more logs were thrown on and the heat increased in intensity, but no signs of flame could be seen on the house except, momentarily, when the paint ignited.

While the inferno raged beneath, a fire was started inside the room above where the logs were piled up awaiting the match, which was also applied by the building commissioner. Every inch of material in this apartment was composed of the varieties of soft and hard woods used in building construction. The nails, screws and glass in the windows alone were the exceptions. The ceiling, the floor, the walls, the mantel and even the hearth were all ornamental and highly finished in the manner of first-class interiors. The door was closed and in a few moments the fire within was even fiercer, if such a thing were possible, than the one without. It was veritably a roaring furnace, which melted the glass in the windows almost at once into streams. Several times the fires were fed with logs, and every possible effort seemed to be exerted to demolish the structure, but it stood defiantly.

The Flames Defied.

The treated wood, however, seemed to laugh in derision at the flames. Gentlemen who did not believe in fireproofed wood and its possibilities were there, but what they saw took them by surprise, and their erstwhile cynicism finally became extravagant praise. Men prominent in the world of commerce, science and letters were present also, and every phase of the test was carefully observed, but at the end, after the fires had continued for about an hour and a half, the opinions, expressed freely all around, were that the process which could produce such a result was marvelous, and that Electric fireproofed wood is the one thing needed in building construction.

Comments by Experts.

O. H. Kingsland, one of the experts who represented the New York Board of Underwriters, pointed to the wooden cap over the top of the chimney as he remarked: "To me the central point of this test is there. The flames have been underneath that board all the time, but it has only carbonized; never flamed at all. It is a great test and the result is very satisfactory." Rudolph Ballun, his colleague, concurred in his opinion.

It is worthy of note that an ordinary log fire on a pair of andirons had been started about nine o'clock in the morning on the wooden hearth of the rooms next to the one where the test fire had been built. At six o'clock in the evening the fire was still burning, but the hearth was only slightly charred and the beautiful wooden mantel, and, in fact, the entire room was, with the exception of slight charring immediately over the flames in the heart of the chimney, in as perfect condition as when first constructed.

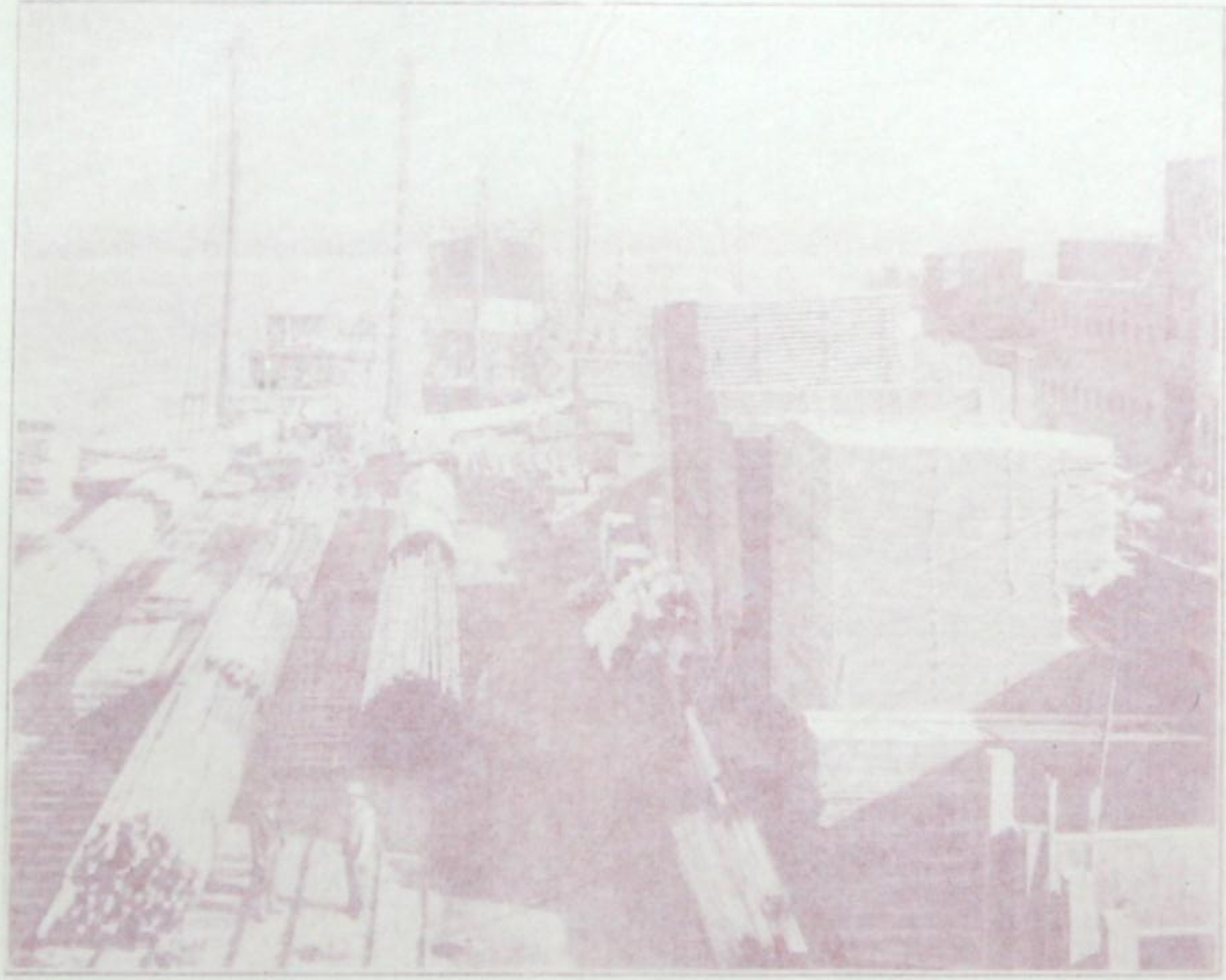
Among the gentlemen present were the following:

Commissioner Thomas J. Brady, of the New York Building Department; Superintendent Dooner, of the New York Building Department; Mr. Ewing, engineer of the New York Building Department; William J. Fryer, architect, and member of the building code committee; Dr. Thomas B. Stillman, professor of analytical chemistry of Stevens Institute of Technology; Gunwald Aus, M. Am. Soc. C. E., of the Treasury Department, Washington, D. C.; Cass Gilbert, architect of the New York Custom House; Mr. Roberts, of the Standard Oil Company; Charles Estee, of Philadelphia; J. C. Plant, representing the supervising architect's office, Washington, D. C.; Ellery Sanford, Royal Insurance Company, New York; Eugene Eales, surveyor, German-American Insurance Company; Stephen W. Dodge, architect; Captain Clarke, of the United States battleship "Oregon"; Naval Constructor William J. Baxter, U. S. N., Boston Navy Yard; Assistant Naval Constructor Spear, U. S. N.; Cornelius O'Reilly, accompanied by Father Lavelle of the Cathedral, New York, and Commissioner Guilfoyle, of Brooklyn; George C. Currier, president of the Electric Fireproofing Company, and D. W. O'Neill.

Conspicuous among a party of distinguished gentlemen who had come from Canada specially to observe this test were the following: R. Prefontaine, Mayor of Montreal; J. A. Thiebaudeau, member of the Canadian Parliament; P. W. St. George, J. R. Kinghouse, G. H. Meldrun, E. Drummond and Humes Hall.—*The Insurance Press, February 28, 1900.*

Experiment and Practice

Most people prefer to be guided by practice rather than by theory. It was probably with this in mind that the Electric Fireproofing Company recently gave a public demonstration of the extraordinary qualities of Electric fireproof wood. It was shown that even when subjected to a heat which melted metal and glass the fireproof wood was absolutely non-flammable and merely charred on the surface. A large company of architects, builders, insurance men, including the Building Commissioner, Thos. J. Brady, Superintendent Dooner, Mr. Wm. J. Fryer and others were present, and all have expressed themselves as not only satisfied, but even surprised at the marvelous exhibition. To those who saw the demonstration and to experts a test of this sort leaves nothing to be desired, but to the public at large no number of tests can have quite the force of a single practical example, such as the one that occurred in the Dun Building.—*Record and Guide, March 17, 1900.*



The Electric Fireproofing Company's Works in New York. View at the rear, looking towards the East River.

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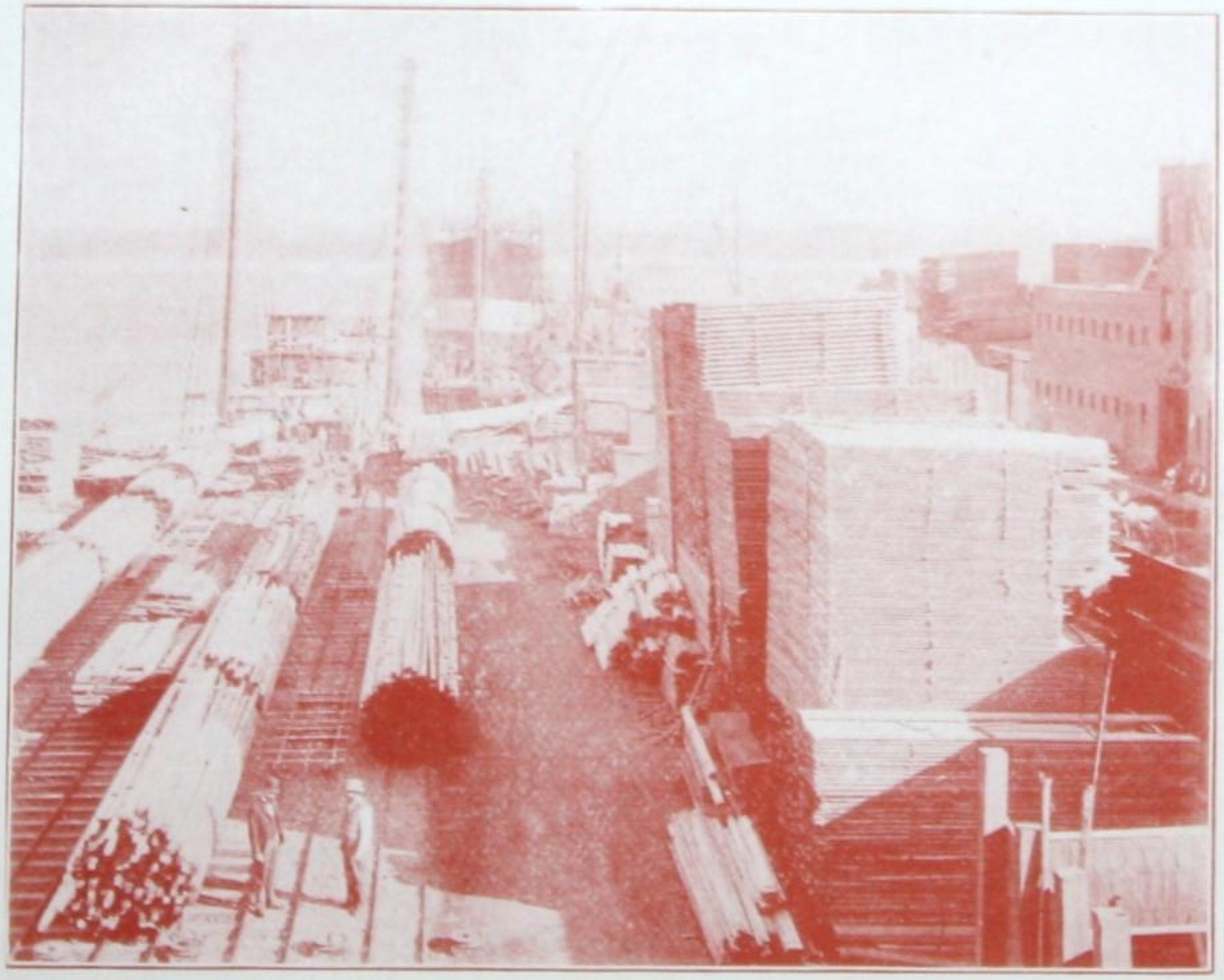


The Electric Fireproofing Company's Works in New York. View at the rear, looking towards the East River.

Testing Fireproof Wood

Architects, engineers, building experts and insurance men from various sections of the United States and Canada arrived in this city for the purpose of attending some interesting tests of fireproof wood, given under the supervision of the New York Board of Fire Underwriters and the Building and Fire Departments of the city.

. . . .

When the inflammable material beneath the structure was set on fire, the flames leaped high in the air, but did little damage beyond giving the boards a charred appearance. One or two of the visitors remained in the house while it was burning, so as to note the effect. A fire was also built within the structure, the smoke coming out through the chimney. The fire was said to be of sufficient intensity to destroy any ordinary building in New York. But the flames did not penetrate the structure.—*Evening Post, February 23, 1900.*

Surprised Everyone

"In the recent test, which occurred on February 23d, a house built of this fireproofed wood was erected, and then by means of pine logs, shavings and kerosene, subjected inside and out to a temperature of about nineteen hundred degrees Fahrenheit. Every bit of metal and glass in the structure was melted, of course, but the wood suffered little more than slight charring. The test was given under the direction of the Building and Fire Departments and the Board of Fire Underwriters of New York City, and the fire was started by Building Commissioner Brady personally. It was witnessed by department officials and many leading architects and builders, as well as representatives from the leading fire insurance companies, from this and other cities, prominent among others being the Mayor of Montreal with a number of representative men from Canada. The extraordinary fire-resisting qualities of the wood surprised every one who was unacquainted with the process."—*N. Y. Tribune, March 18, 1900.*

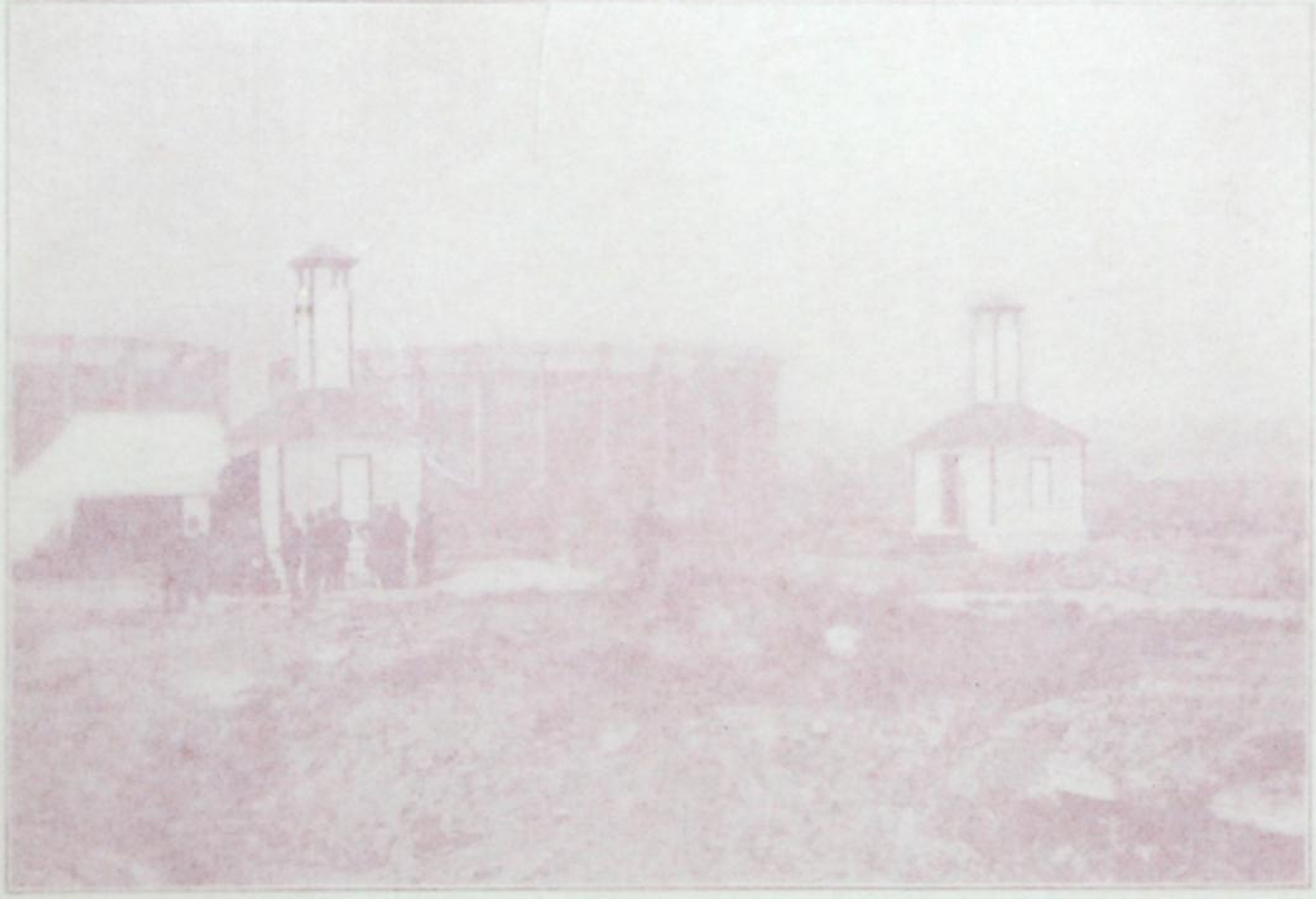
The Electric Process in Europe

The Tests in London

ALTHOUGH many tests have been made privately, no public demonstration of the reliability of the Electric fireproofing process has been given in the United States since the one at Atlanta, Ga., on the 9th of December 1895, until that of February 23, 1900.

Tests of wood treated by this process, however, were made in England, France and Saxony. The first of these was in London, where the fact that wood could be made fireproof was first made known by Mr. Edwin M. Fox, the famous founder of the Harvey armour plate process.

This demonstration was especially arranged by Mr. Fox for the satisfaction of the officials connected with Her Majesty Queen Victoria's Office of Works, on the site of the old Millbank prison. It took place May 11, 1897, in the presence of H. R. H. the Prince of Wales and other members of royalty, and the officials referred to, besides many gentlemen conspicuous in the world of science and letters.



The Treated House. BEFORE THE FIRE. The Untreated House.

The First Test of Electric Fireproofed Wood in London, May 11, 1897.

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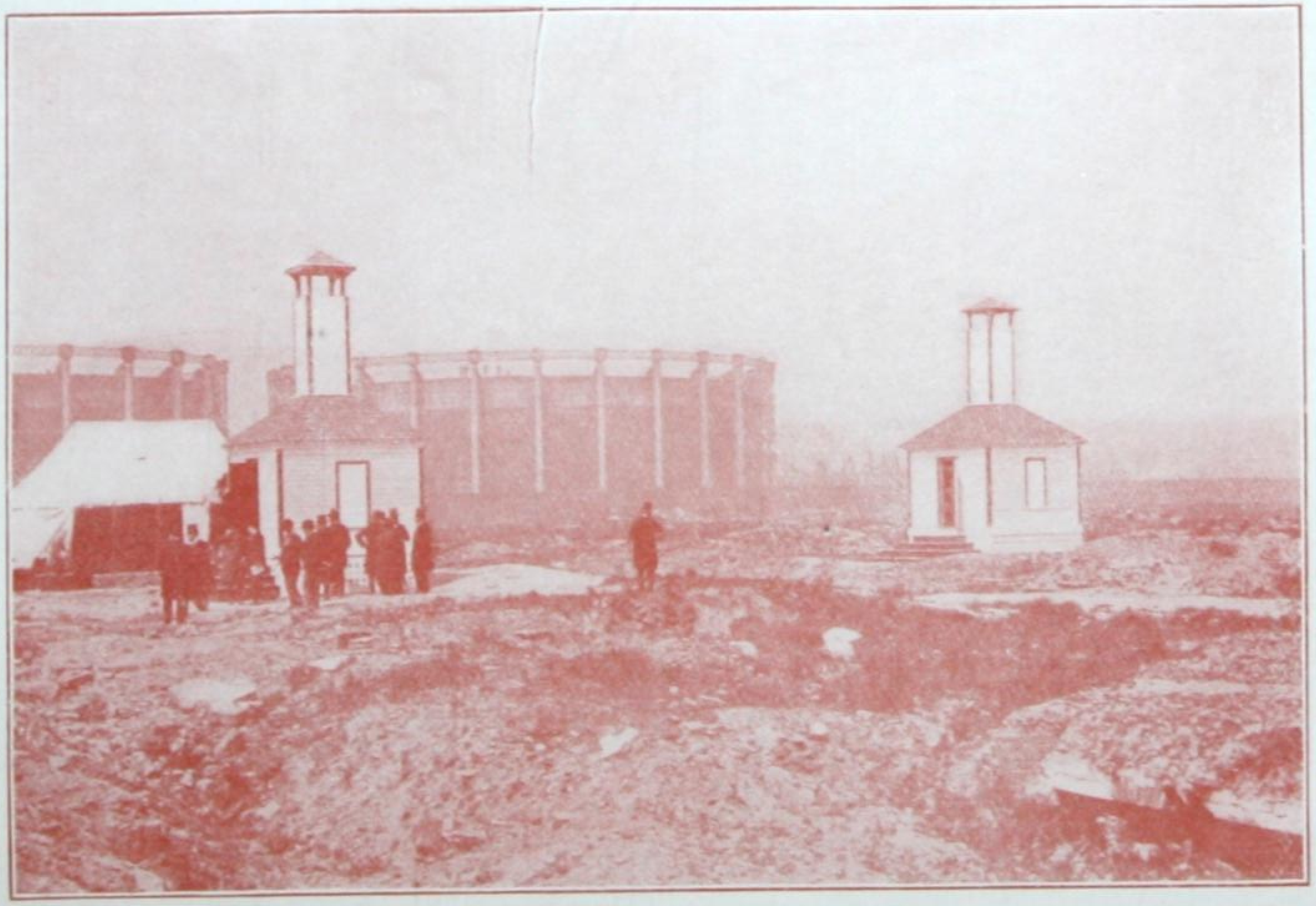

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This test differed from those which had been given in America, inasmuch as two houses were built from the same design, one of *treated* and the other of *untreated* wood, in order to make a telling comparison.

The houses were each 11 feet by 11 on the ground, and about 30 feet high to the top of the chimney, which was also of wood. They were placed on wooden posts, two and a half feet from the ground. The framework of both buildings was of fir; the clapboards and shingles of white pine; the flooring of yellow pine, and the interior finish of yellow pine, oak, mahogany, ash, birch and sycamore. The walls of the house built of the fireproofed wood were left with open lath work, to facilitate combustion, except one, which was panelled in birch, mahogany and sycamore, highly finished.

Shavings and firewood, thoroughly saturated with petroleum, were heaped high against the sides of both houses and ignited at the same time. This test was a convincing proof that wood treated by the Electric process would neither catch fire nor communicate it. The *untreated* house was burned to the ground, while the *treated* house remained comparatively intact.

Francis Edgar, Fellow of the Royal Society, M.R.C.E., and former director of H. M. Dockyards, concludes his report of this important test with these words:—

"The treated wood is well adapted for use in ships, where fireproof material is especially desirable. In the neighborhood of magazines its low conductivity, apart from non-inflammability, would give much greater security against overheating than the ordinary material. It would appear impossible to set fire to the woodwork of a ship if it were treated by this process."

J. H. Biles, Professor of Naval Architecture of the Glasgow University, also witnesed this test, and concludes a highly favorable description as follows:—

"Wood treated by this process does not shrink. The wood is for all practical purposes unimflammable; so much so, that the shavings and sawdust cannot be disposed of by burning in the ordinary way; I should think that any structure made of this wood treated by the Electric process would be for all practical purposes fireproof."

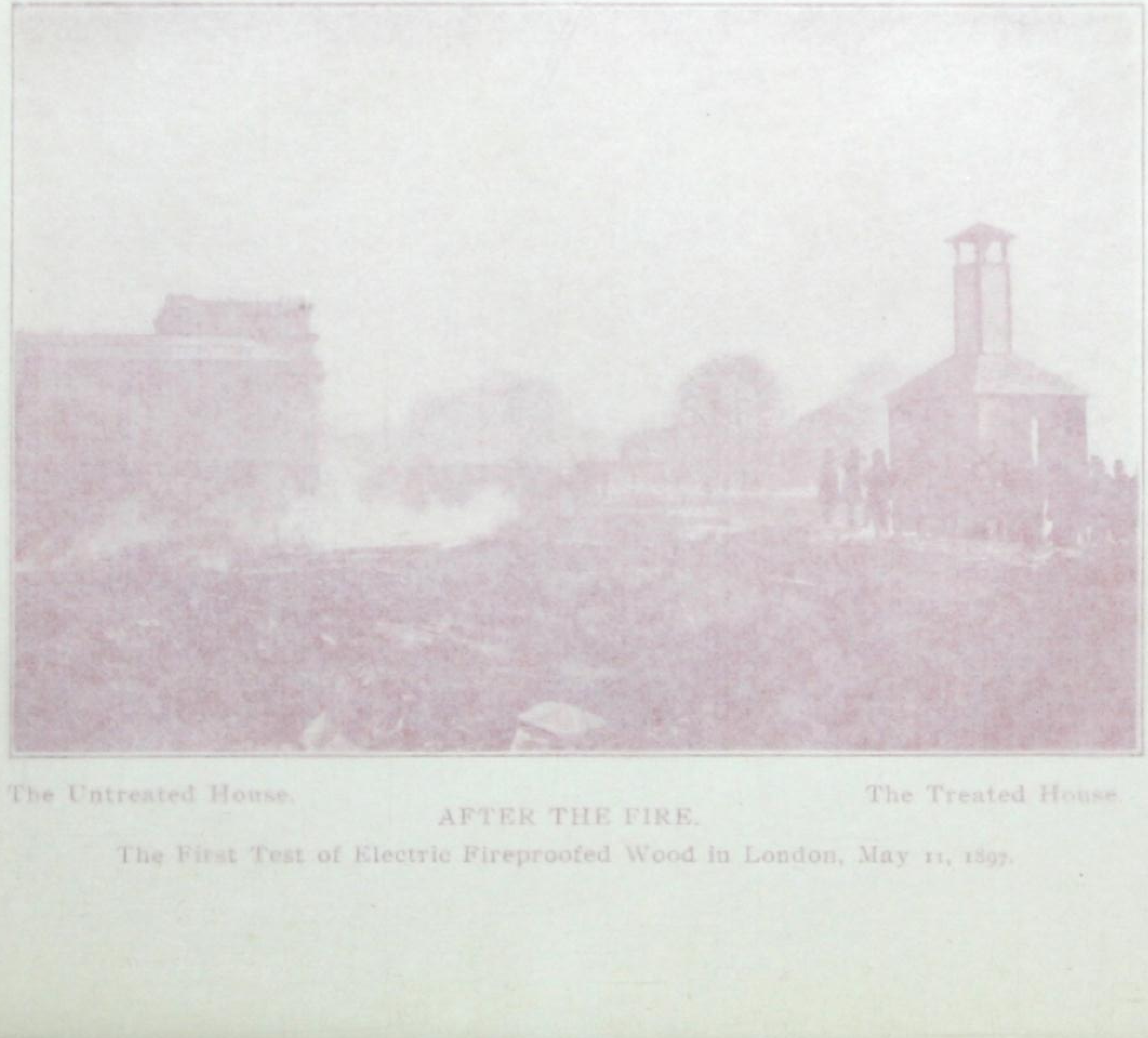
Some Comments of the London Press

The Times, May 12th, 1897.

"On the site of the old Millbank Prison, yesterday, a new American process for rendering wood non-inflammable was submitted to a practical test in the presence of a number of onlookers, including the Prince of Wales, the Lord Chancellor, the United States Ambassador, Lord Llandaff, Lord Portarlington, Lord Londonderry, Sir Arthur Sullivan, Mr. John Penn, M.P., Mr. R. G. Webster, M.P., General Russell, M.P., and Albert Vickers.

. . . .

"The resistance offered by the treated building may be judged from the fact that it was entered without any discomfort twenty minutes after the fire had been started, when the building of untreated timber was a mass of flame, which could not be approached nearer than fifteen or twenty yards. It was next subjected to a further and perhaps severer test. A heap of shavings and wood, also soaked with paraffin, which had been lying inside the building while the fire was blazing outside, was ignited, the doors and windows being opened in order to create a strong draught. The building remained intact, and a box made of the treated wood, which had been placed in the



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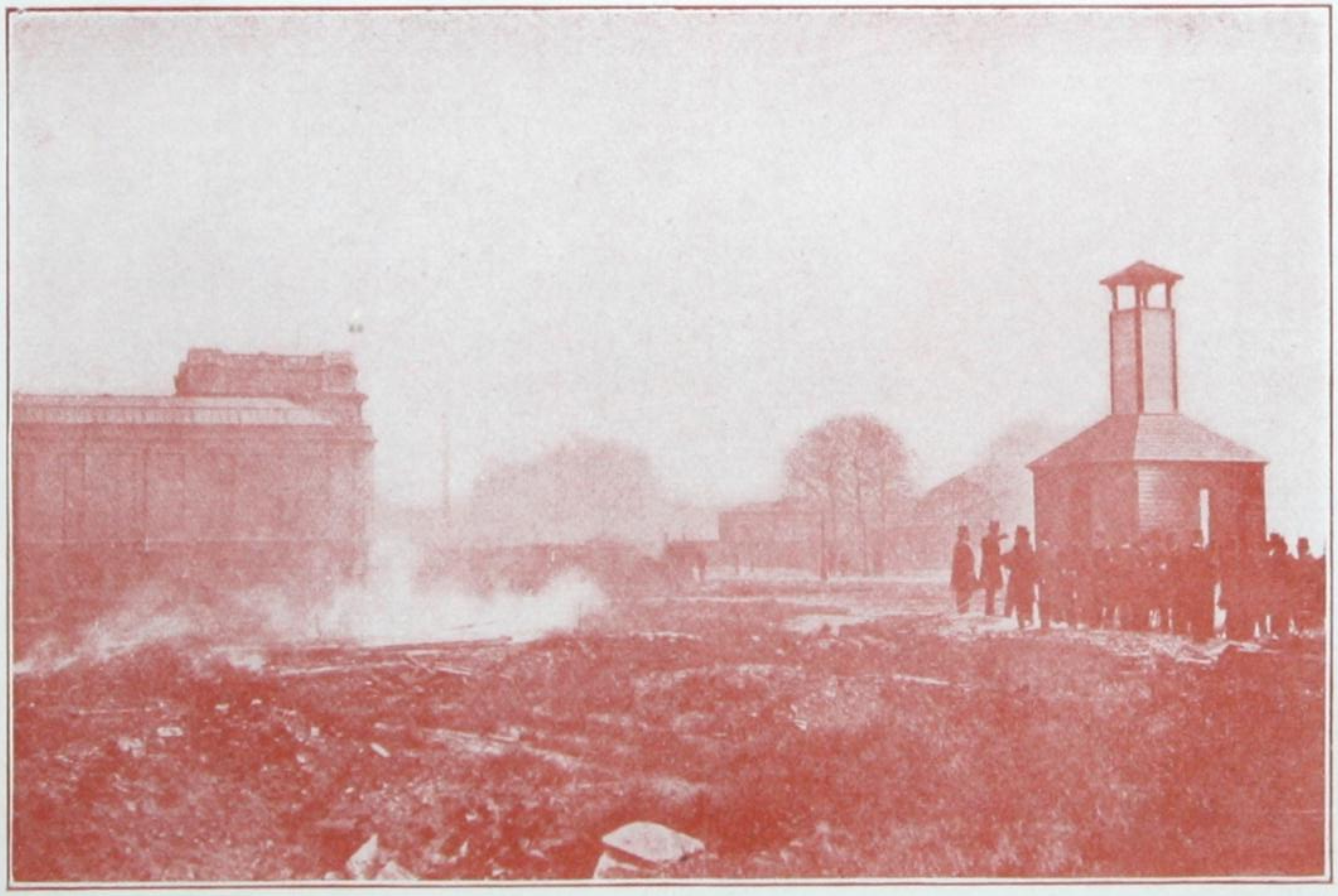

The Untreated House. The Treated House.

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interior at the beginning of the experiment, was taken out at the end, with its contents quite undamaged."

The Morning Post, May 16th, 1897.

"Are we on the eve of a total revolution of our ideas as to the inflammability of wood? Hitherto we have looked on dry wood as being the sort of material that merely required the application of a lighted match in order to produce a blaze; but if some experiments carried out on the site of the old prison at Millbank possess any real meaning, we shall have to entirely reconsider the opinions generally entertained up to this time.

. . . .

"Like many other valuable discoveries, this comes from the United States.

. . . .

"It is surely desirable to adopt a system which bids fair to improve the security of battleships and to save many lives."

Pall Mall Gazette, May 11th, 1897.

"The notion of fireproof wood will strike most people as curious; but none of the gentlemen who accompanied the Prince of Wales yesterday to witness a trial of this material will deny that it is practicable.

. . . .

"The Prince of Wales made a gallant effort to cut his way through the fire and smoke, to be the first to see the effect of the fire on the wood, but after surmounting the steps which led to the door he had had enough, and made way for others. Finally, a huge bonfire of paraffin and faggots was lighted inside the room, and all the doors and windows were opened, so that one could see the enormous mass of flame within. Yet, though the glass of the windows melted and ran like water, the panelled walls were uninjured.

. . . .

"Certainly, in face of the awful disaster in Paris, than which no better advertisement for this trial could have been devised, there seem to be abundant reasons for the adoption of the process."

Daily News, May 12th, 1897.

"The Prince of Wales, accompanied by Prince Edward of Saxe-Weimar, yesterday morning witnessed a test of a fireproofed wood which holds out the hope of greatly reducing the chances of fires.

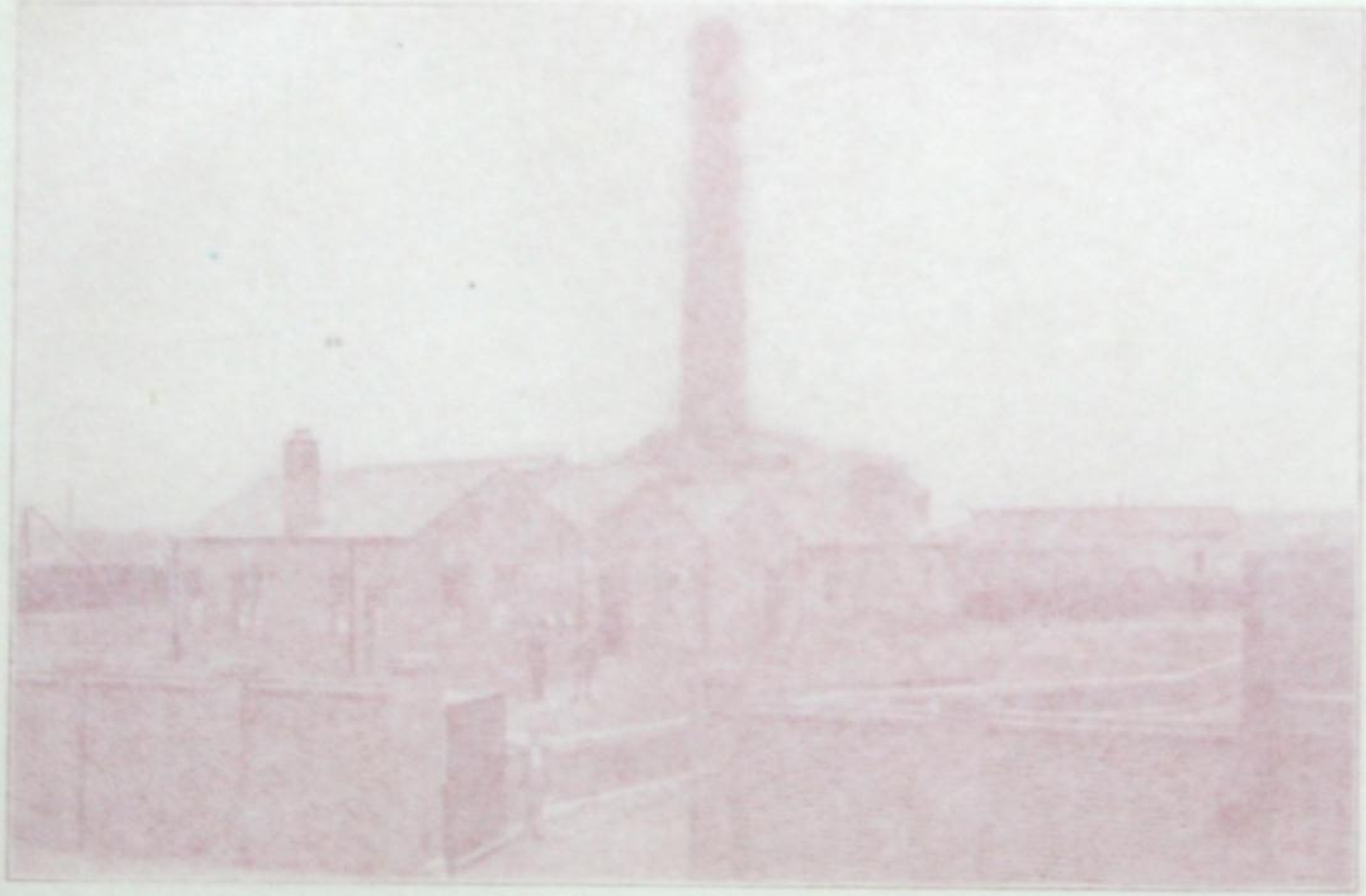
. . . .

"The test was a severe one—as severe as could be wished for—but the result, in the opinion of the large number of gentlemen assembled to see it, was eminently satisfactory, and the new material should have a big future before it. Amongst those present were the Lord Chancellor, the Austrian Ambassador, the United States Ambassador, Lord Tweedmouth, the Hon. R. B. Brett, Lord Londonderry, Lord Claud Hamilton, the Hon. Ivor Bligh, Sir Arthur Sullivan, Vice-Admiral Sir John Fisher, Sir Douglas Fox, General Russell, M.P., General D. Manuel de la Camara, Sir Edward Hamilton, Prince Blucher de Wahlstatt, Lord Portarlington, Baron Fersta, Sir Norman Pringle, Viscount Llandaff, Count Lavison, Mr. M. F. Williams, M.P., Mr. J. Penn, M.P., Mr. C. McLaren, M.P., Mr. R. G. Webster, M.P., and Mr. Sidney S. Gamble, of the Metropolitan Fire Brigade."

Tests in Paris and Gotha

The next public demonstration was made in Paris, on the 29th of July, 1897. The site selected was on L'Esplanade des Invalides, and the arrangements for this test were also made by Mr. Edwin M. Fox, and the houses subjected to the flames were built to the same designs and of similar materials to those which were used in London. Similar conditions prevailed, and the results were practically the same, and called forth unqualified expressions of amazement and approval from the many government officials and scientific gentlemen who were present.

On August 8th of the same year, Mr.



The Works of the Non-Flammable Wood Company, London, operating the Electric Fireproofing Process.

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"The Prince of Wales, accompanied by Prince Edward of Saxe-Weimar, yesterday morning witnessed a test of a fireproofed wood which holds out the hope of greatly reducing the chances of fires.

. . . .

"The test was a severe one—as severe as could be wished for—but the result, in the opinion of the large number of gentlemen assembled to see it, was eminently satisfactory, and the new material should have a big future before it. Amongst those present were the Lord Chancellor, the Austrian Ambassador, the United States Ambassador, Lord Tweedmouth, the Hon. R. B. Brett, Lord Londonderry, Lord Claud Hamilton, the Hon. Ivor Bligh, Sir Arthur Sullivan, Vice-Admiral Sir John Fisher, Sir Douglas Fox, General Russell, M.P., General D. Manuel de la Camara, Sir Edward Hamilton, Prince Blucher de Wahlstatt, Lord Portarlington, Baron Fersta, Sir Norman Pringle, Viscount Llandaff, Count Leveson, Mr. M. F. Williams, M.P., Mr. J. Penn, M.P., Mr. C. McLaren, M.P., Mr. R. G. Webster, M.P., and Mr. Sidney S. Gamble, of the Metropolitan Fire Brigade."

Tests in Paris and Gotha

The next public demonstration was made in Paris, on the 29th of July, 1897. The site selected was on L'Esplanade des Invalides, and the arrangements for this test were also made by Mr. Edwin M. Fox, and the houses subjected to the flames were built to the same designs and of similar materials to those which were used in London. Similar conditions prevailed, and the results were practically the same, and called forth unqualified expressions of amazement and approval from the many government officials and scientific gentlemen who were present.

On August 8th of the same year, Mr.

The Works of the Non-Flammable Wood Company, London, operating the Electric Fireproofing Process.

Fox again had two similar houses constructed and tested in the same manner at Gotha, Saxony, for the satisfaction of naval constructors and government representatives. The results, as heretofore, were indisputable, and the conviction that the Electric process positively rendered wood uninflammable was well carried home.

All Europe was rapidly becoming convinced that the Electric process did all that was claimed for it. Great Britain and Denmark soon placed large orders for fireproofed wood with the British company operating the process, while the French government ordered a commission of investigation, with a view to its adoption in the construction of war vessels.

The investigations of the French government resulted in an extensive order being placed with the London company a few months later.

Among notable buildings in England in which wood treated by this process has been used, may be mentioned the British Museum, Crystal Palace, Mr. Wyndham's new Theater, St. Pancras Iron Works, Bedford Grammar School and Wallace & Co.'s Furniture Warehouses and Factories.

Following the example of England and France, Norway, Denmark and far away Japan have all practically shown their approval of wood fireproofed by the Electric process by placing large orders for it with the companies operating the system.

The Russian government also, after a searching examination into the value of the Electric fireproofed wood, covering a period of more than two years, has just adopted it for the wood to be used in the construction of warships, and only recently ordered that the new Russian cruiser "Variag," now building at Cramps' shipyard in Philadelphia, shall have no wood in her construction but what is treated by the Electric process.

Test by the British Fire Prevention Committee

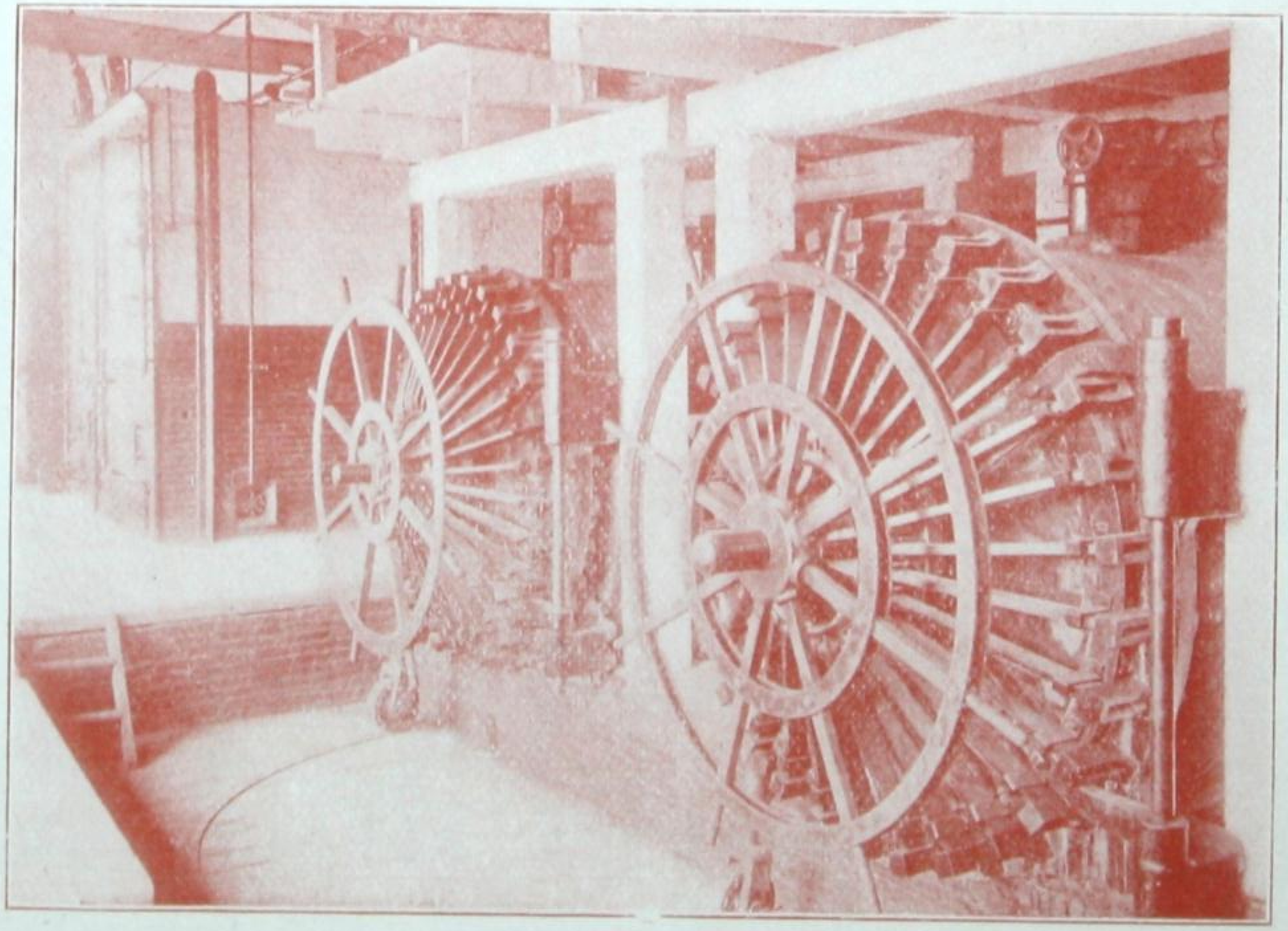
The British Fire Prevention Committee, of London, has for its members government officials of high rank and representative men of science. Its objects are to direct attention to the urgent need for increased protection of life and property from fire by the adoption of preventive measures, and to increase its influence in every direction toward minimizing the possibilities and dangers of fire.

This committee from time to time has made a number of tests of various building materials or systems of construction. The most recent test, however, has been somewhat different from the others, inasmuch as it was for the purpose of investigating the non-flammability of wood.

The committee's report of the test is a clear statement of facts as to the application of a "non-flammable" wood which has for its aim the prevention of fire in its truest sense.

Mr. Edwin O. Sachs, the chairman of the committee, prefaces his report as follows:—

"The purpose of the tests undertaken by the British Fire Prevention Committee is to obtain



The Electric Fireproofing Company's Works in New York.—View in the Cylinder Room.

reliable data as to the exact fire-resistance of the various materials, systems of construction or appliances used in building practice.

"The tests are of entirely independent character, arranged on scientific lines, but with full consideration for the practical purpose in view. Absolute reliability is assured, records being mostly taken automatically, and the temperature being easily regulated by the application of gas.

"All reports on tests state the bare facts and occurrences."

The object of the test was to record the effect of fire upon Electric fireproofed wood (yellow pine); particularly to ascertain whether the treated wood sustains or spreads flame when in contact with fire.

The order of the test was arranged as follows:—

First Stage.—The application of flame for five minutes from one side at a temperature of about 500 degrees Fahr.

Second Stage.—The application of flame for ten minutes from the same side, and at approximately the same spot, at a temperature of about 750 degrees Fahr.

Third Stage.—The application of flame for fifteen minutes for the same side at a second spot, and at a temperature of about 900 degrees Fahr.

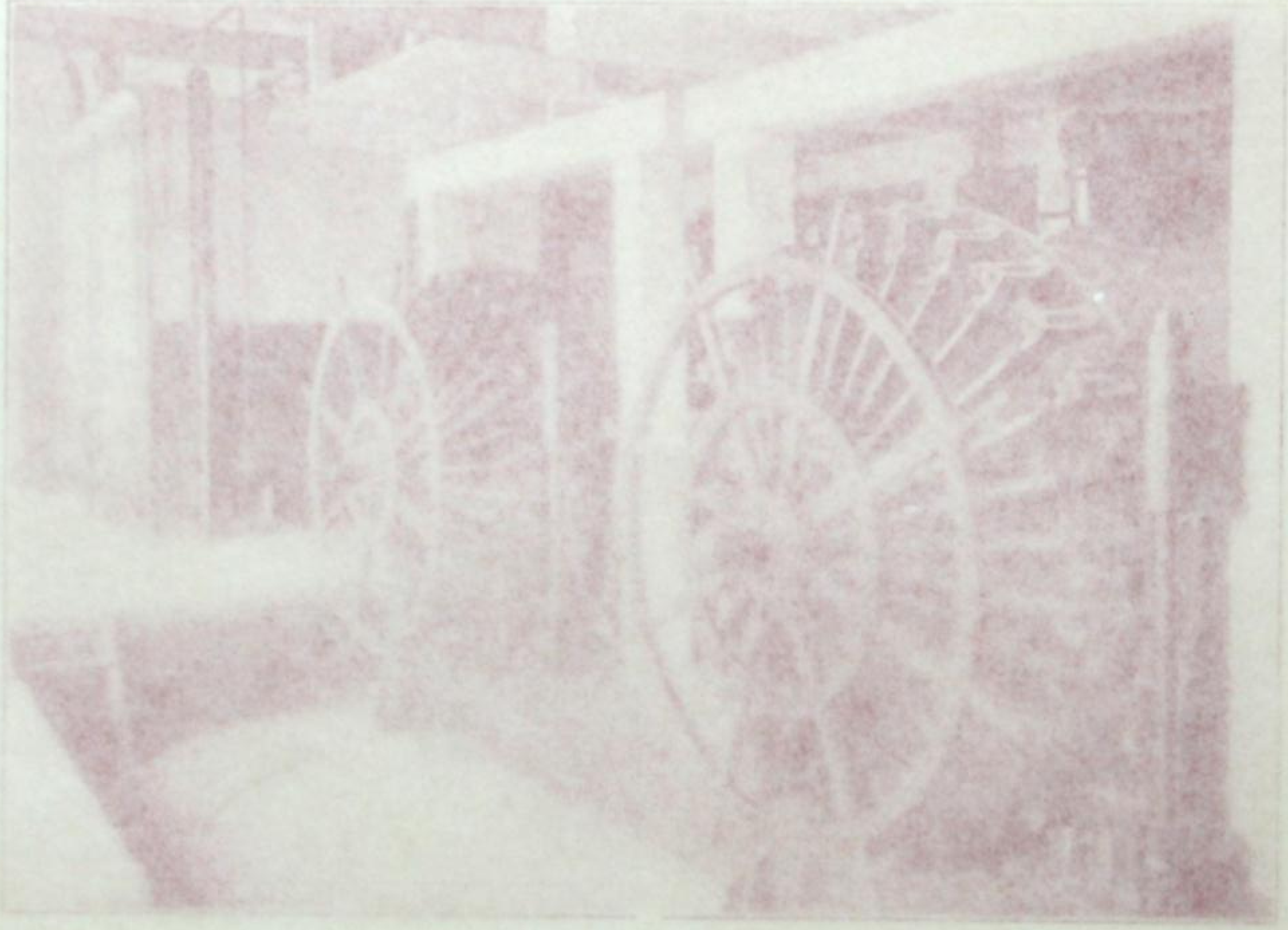
The three stages of the test were to follow at the shortest possible intervals, and one-inch yellow pine boards were to be used in the form of a partition.

"No incandescence or spread of flame was observed, nor did the material, as far as could be seen, contribute in any way to the spread of flame."

"The surface of the boards was charred."

Flame had been applied at much higher temperatures than those specified in the "object of the test." The temperature rose in the first stage to about 1,000 degrees Fahr., in the second stage to about 1,150 degrees Fahr. and in the third stage to about 1,300 degrees Fahr.

The testing chamber, which was located at the committee's own grounds near Regent's Park, was constructed with stock bricks with lime mortar, and measured 10 feet by 10 feet internally. The soffit of the hut was 8 feet 3 inches above



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The testing chamber, which was located at the committee's own grounds near Regent's Park, was constructed with stock bricks with lime mortar, and measured 10 feet by 10 feet internally. The soffit of the hut was 8 feet 3 inches above the pavement of the chamber, and was constructed of concrete. The door opening was on the north side, and measured 2 feet 3 inches by 6 feet 6 inches. The fuel used was gas produced at the station, and the supply was regulated by valves and dampers. A Roberts-Austen pyrometer was used for recording temperatures, eight observation points in all being used. There were observation holes, one in the east and one in the west walls, covered by sliding hatches, and two small observation holes in the south wall not covered. The draught holes were in the east and west walls.

The boards were placed in position in the form of a partition. The partition ran from east to west, and was 7 feet 3 inches high and 10 feet wide. There were four 2-inch by 3-inch studs of yellow pine, treated by the Electric process. Two of the studs were nailed to the outside walls; the two intermediate ones rested on the floor; they were the full height of the partition, and were tenoned into two-inch by three-inch yellow pine head, and well nailed. The studs were then covered with one-inch rebated boarding of yellow pine, which had also been treated by the Electric process. There were nine boards in the height, varying in width from eight inches to eleven inches.

The boarding was fixed on one side only of the studs—that next to the gas outlets. The top of the partition did not extend to the soffit of the concrete roof of the hut. There was an open space of twelve inches between the soffit and the top of the partition.

Each board was nailed to the studs with three four-inch wire nails, three nails at each stud, and were clinched at the back. The partition was placed four inches from the center of the gas outlets. The timber was all dry and well seasoned, and had been treated by the Electric fireproofing process.

At 3 p. m. the meteorological observations at Regent's Park, London, read as follows: Weather cloudy, fine, warm; wind west; barometer, 30′ 19; attached thermometer, 75 degrees Fahr.; dry bulb, 78 degrees Fahr.; wet bulb, 66 degrees Fahr.

First Stage.—At 3.05 p. m. the gas was lighted on the west side, the flame being in contact with the partition. At 3.10 p. m. the gas was shut off. On examination there was found to be no incandescence, flame, spread of flame, or fire; the surface of the boarding was charred to a depth of about one-sixteenth of an inch.

Second Stage.—At 3.15 p. m. the gas was relighted, the flame rising up against the partition and striking against the ceiling, and lapping over the top of the partition.

The following temperatures were the highest recorded from 3.06 p. m. to 3.25 p. m.:—

First Stage.	3.06 p.m.	350 degrees Fahr.
	3.08 "	1,000 degrees Fahr.
	3.10 "	1,075 degrees Fahr.
	3.12 "	1,000 degrees Fahr.
	3.16 "	1,025 degrees Fahr.
Second Stage.	3.18 "	1,175 degrees Fahr.
	3.20 "	1,210 degrees Fahr.
	3.22 "	1,150 degrees Fahr.
	3.23 "	1,180 degrees Fahr.
	3.24 "	1,215 degrees Fahr.
	3.25 "	1,150 degrees Fahr.

At 3.18 the patented solution with which the wood had presumably been treated was boiling on the surface of the wood. At 3.25 p. m. the gas was shut off on the western side.

Third Stage.—At 3.25 p. m. the gas was lighted on the eastern side, the flame rising up against the partition to the soffit of the concrete roof as in the former case.

The following temperatures were the principal records of the pyrometer:—

Third Stage.	3,26 p.m.	450 degrees Fahr.
	3.28 "	1,125 degrees Fahr.
	3.30 "	1,235 degrees Fahr.
	3.32 "	1,300 degrees Fahr.
	3.34 "	1,310 degrees Fahr.

At 3.35 1-2 p. m. the gas was shut down. On examination no incandescence or spread of flame was observed on any part of the partition. This concluded the test.

The lower boards were found to be charred to a depth of one-sixteenth of an inch. The upper edge of the top board was charred through its thickness where the flame struck the ceiling and lapped over the partition.

The test was carried out in accordance with the procedure laid down by the executive committee and conducted by a sub-committee comprising Mr. Max Clarke, A. R. I. B. A.; Mr. F. Hammond, F. R. I. B. A., district surveyor; Mr. Ellis Marsland, district surveyor; Mr. Thomas Kissock, resident engineer, and Mr. I. E. Leslie Alldridge, of the royal mint. The London County Council was represented by Mr. Thomas Blashill, F. R. I. B. A., F. S. I., and Sir John Taylor, K. C. B., H. M. Office of Works. The executive was represented by Edwin O. Sachs, chairman; Mr. Robert Mond, M. A., F. R. S. E.; Mr. Edmund Woodthorpe, M. A., F. R. I. B. A., district surveyor. The Members' Testing Committee was represented by Mr. George E. Monckton, M. A. The general body of members was represented by Mr. S. Flint Clarkson, F. R. I. B. A., district surveyor; Mr. R. P. Notley, F. R. I. B. A., first district surveyor, and Mr. W. White, F. S. A.

The Electric fireproofing process was represented by Mr. E. Marshall Fox, S. Eversher and A. J. Greenop.

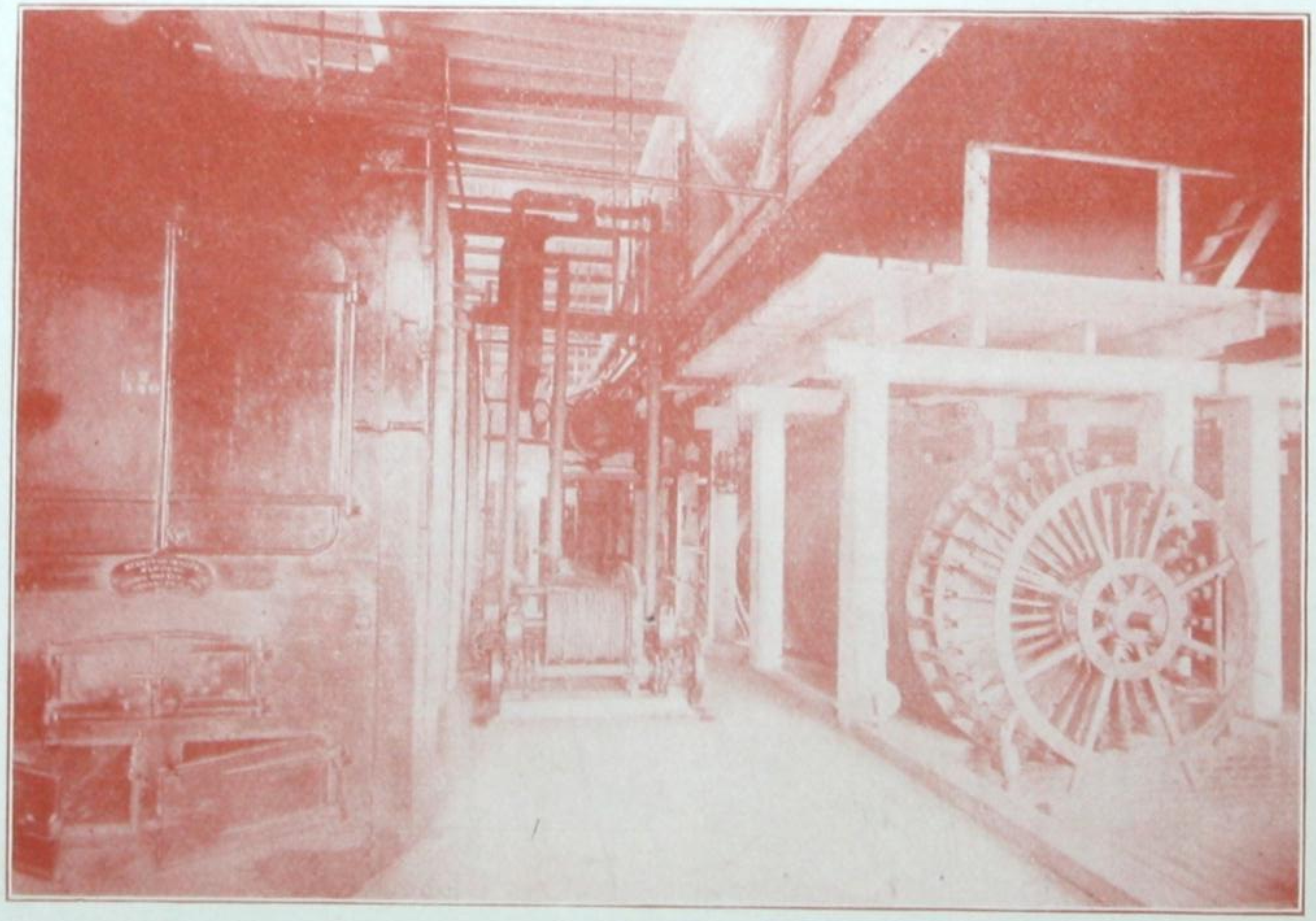
The following gentlemen attended by invitation of the executive committee: Admiral Sir George Nicholson, K. C. B., Mr. O. B. Leitch, assistant director of works at the admiralty. Lieutenant P. S. Greig, R. E., of the war office; Mr. F. S. Capon, of the London County Council; Major E. Palliser, Captain G. McArthur, R. N.; Mr. C. V. Childs, Mr. J. E. Golding, Mr. Egan Hill, Mr. J. D. O'Brien, Mr. George Pritchard and Mr. Thomas Rewe.

The report of the test was signed by Max Clarke, Fred. E. Farrar and Edwin O. Sachs.

Electrical Engineers' Test and Report

Report anent Electric fireproofed wood from Foote and Milne, Electrical Engineers and Contractors, London, S.W., February 15, 1899:—

"In accordance with your instructions, we have carried out some experiments as to the relative inflammability of your prepared casings for electric wires, and ordinary American white wood.



The Electric Fireproofing Company's Works in New York. View in Cylinder Room.

"We submitted both samples to the heat of an electric arc, with the following results:—

"*First Experiment.*—With arc horizontal and casing laid immediately above, ordinary casing caught fire and flamed in one-and-a-half minutes; prepared casing in the same position was, at the end of five minutes, charred for about two inches around the arc, but did not flame.

"*Second Experiment.*—With horizontal arc and casing laid immediately below, ordinary casing flamed in two minutes, and at the end of five minutes was completely burned away around the arc; prepared casing in the same position, at the end of five minutes, was charred for about one-and-a-half inches, but did not flame.

"*Third Experiment.*—Arc made to play through a half-inch hole bored in casing; ordinary casing burst into flame in half a minute; prepared casing in the same position at the end of five minutes was charred around the hole for a distance of three-quarters of an inch, but did not flame.

"To summarize the results of these experiments, we find that whereas, if an electric arc played upon ordinary casing from half a minute to two minutes, it would catch fire and burst into flame.

"It was *impossible to ignite the prepared* casing, which, in all our experiments, was only slightly charred.

FOOTE & MILNE."

London Graphic, October [illegible], '98.

"It is gratifying that the British Admiralty has given a large order for (Electric) non-flammable wood.

"It was used on board the 'Iowa,' and, according to Captain Robley Evans, withstood the wear and tear of service as well as ordinary untreated wood."

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Our Government's Recognition

THERE can be no doubt that Hilary A. Herbert was pre-eminently fitted for the position he held as Secretary of the Navy of the foremost republic of the world. Although educated in the law, his inclinations led him to travel and study the various methods of older and more experienced nations in the art of defence on sea and land, but more especially in the construction and manning of warships. He permitted nothing to escape his notice which he thought might perfect the naval defences of his country, and was constantly in search of the best materials or the latest improvements for the construction of warships and their equipment.

We find from the Boston papers of May 5, 1895, that Mr. Hichborn, of the Boston Navy Yard, saw the public test in Boston of wood which had been treated by the Electric fireproofing process, and declared that the test was "a great success." He doubtless reported to Washington and Secretary Herbert was informed of what he had seen, and a few weeks later the whole world learned that our government had sufficient confidence in Electric fireproofed wood to order it for the battleship "Iowa" and the cruiser "Brooklyn." The following despatch appeared in the New York Herald of July 25, 1895, and was copied by all the leading newspapers:—

Fireproof Ships for the Navy.

WASHINGTON, D. C., July 24, 1896.

"Fireproof wood will be used in the construction of the battleship 'Iowa' and the cruiser 'Brooklyn.' Orders to this effect have been issued by Secretary Herbert, and Naval Constructor Linnard, superintending constructor at Cramp's yard, has been directed to carry them out. The wood is fireproofed by the Electric fireproofing process, exhaustive tests of which were recently made by Naval Constructor Hanscom. If the wood proves to be satisfactory in the vessel named, the gunboats soon to be contracted for will be built of it.

"The process consists in forcing sulphate and phosphate of ammonia into the wood by hydraulic pressure. Most satisfactory results have been obtained from woods treated by it, they having been subjected to high temperatures and failing to ignite, carbonizing a little in consequence of the intense heat."

The Naval Secretary readily recognized that the advent of wood which could be relied upon to be absolutely proof against flame and fire under all conditions and at all times, must be of vital importance in naval construction.

The terrible destruction of Chinese ships by the Japanese shells in the war between China and Japan was a startling argument in favor of the needed fireproofed wood.

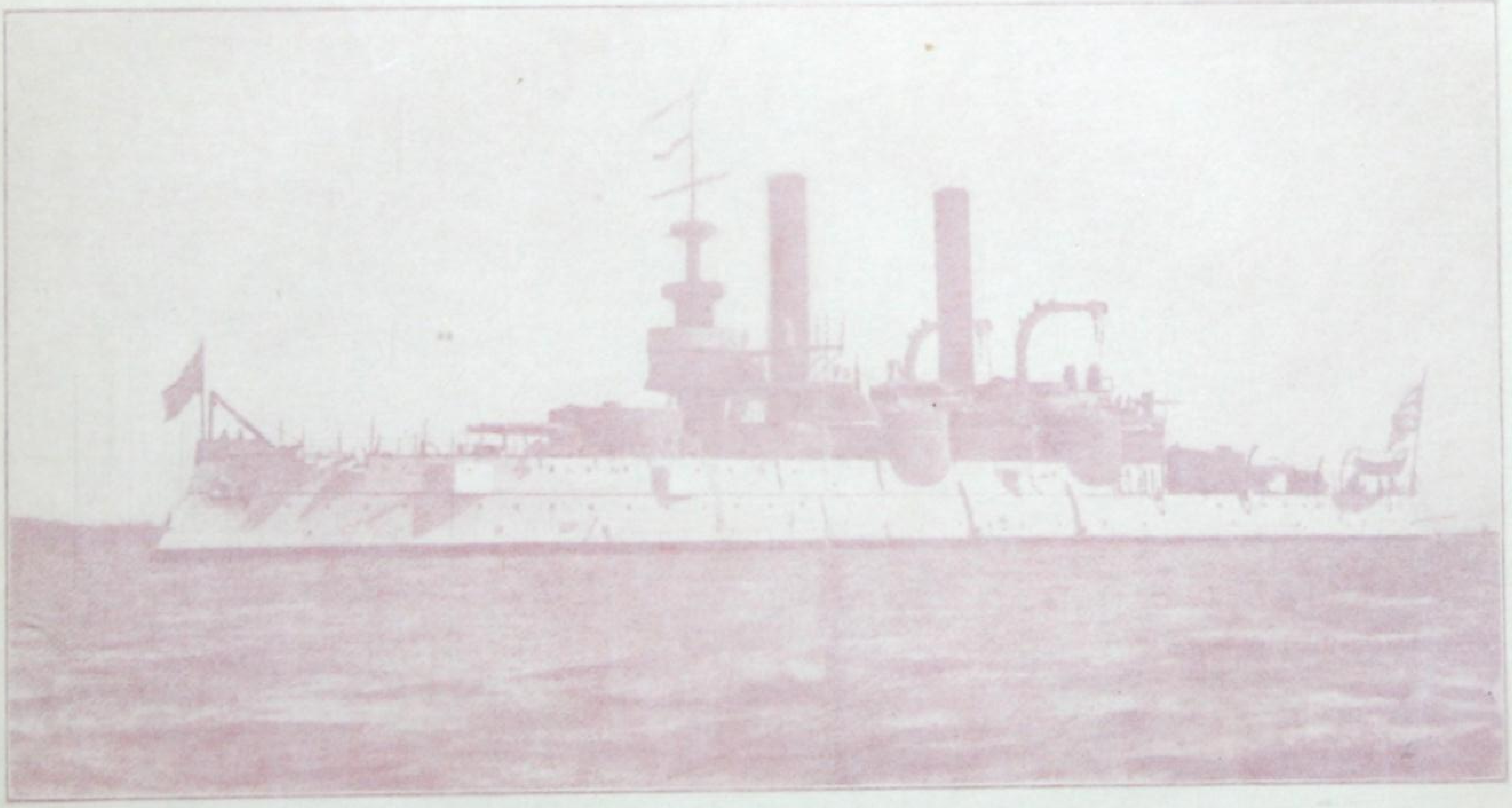
J. H. Biles, Professor of Architecture of Glasgow University, tells us that when he was in Japan, soon after the war:—

> "The Chinese ships suffered more from the effects of the fire upon the woodwork than the Japanese ships," he declares, "and it is quite possible that had the wood of these vessels been treated by a process giving such good results as the Electric, that the results of the fight may have been very different. There is no doubt," he concludes, "that the course adopted by the American navy, of treating all woodwork in ships of war by this process, is a most important improvement in the fighting capabilities of those ships."

But after all, the exhibition of wood's inflammability in this war was but a repetition of what the world has seen a thousand times.

The lessons conveyed by the ill-fated Chinese vessels doubtless acted as a further incentive towards the complete acceptance of the Electric process by our government officials at Washington. The wisest governments are slow in the adoption of innovations, but Secretary Herbert knew that Electric fireproofed wood was no ordinary innovation,—it was an absolute necessity.

On the 21st of January, 1896, a series of private experiments of the process had been concluded, and Chief Naval Constructor Hichborn expressed his opinion to the correspondent of the Philadelphia Press. The opinion is embodied in the despatch which appeared in that paper the next day, as follows:—



U.S.S. "IOWA."
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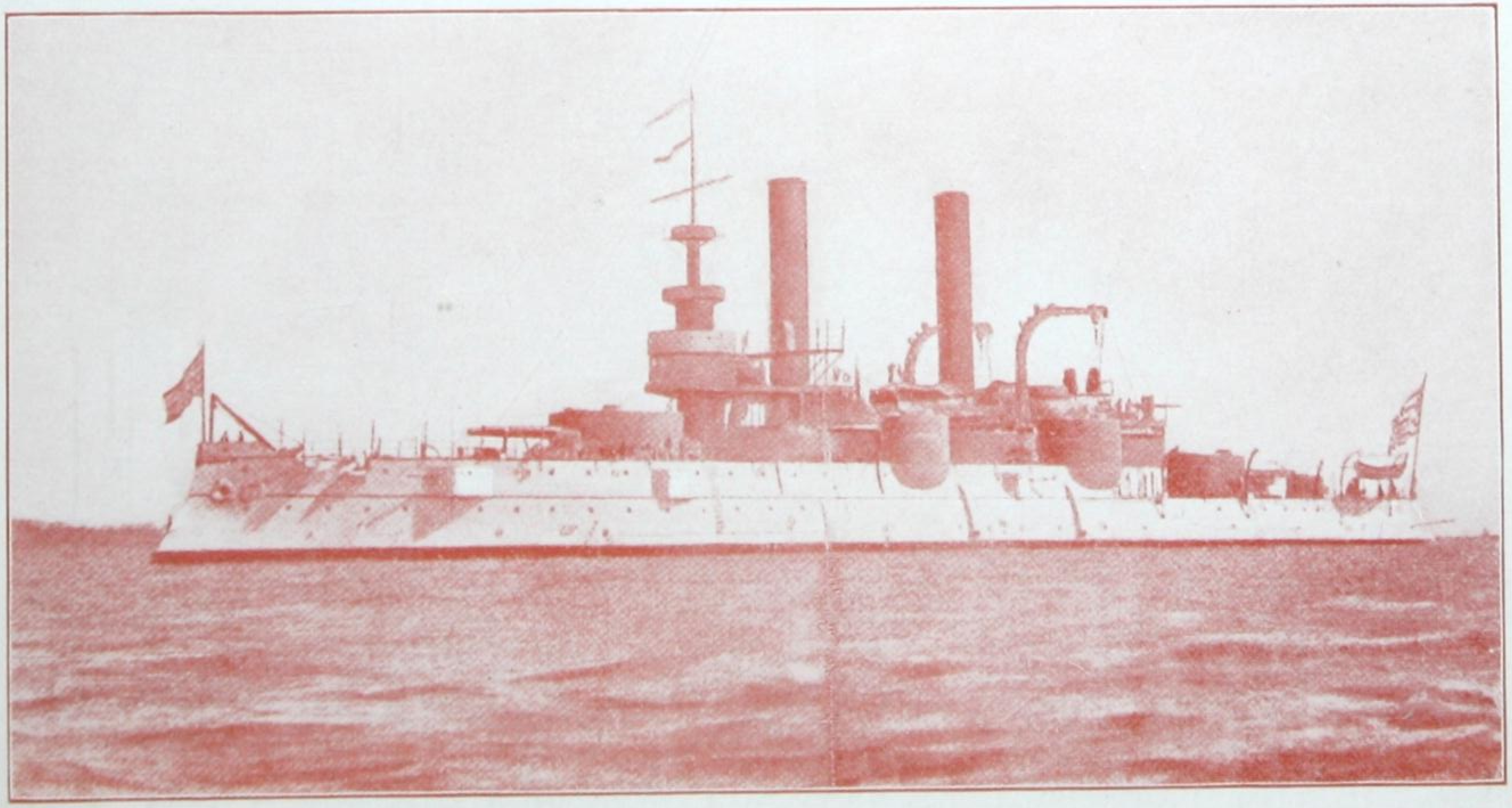

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Washington, Jan. 21, 1896.—The Navy Department has found a very satisfactory method of making woodwork non-combustible. This is done by what is called the Electric fireproofing process, to which all woodwork is subjected before it goes into the equipment of men-of-war. There were recently some very severe tests of the material treated by this process, and, among other trials, was the placing of some of the wood in a furnace in the department basement. It was found that the material could not be destroyed by flame, and since then the process has been adopted for the lumber which enters into deck construction, the woodwork of the cabins and even the material out of which the furniture is made.

Chief Naval Constructor Hichborn said today: " 'We are using it entirely, and believe it will promote the safety of those on board. It will assuredly prevent conflagration at sea and remove that danger from the usual results of battle. There has always been a natural fear of burning on the deep. An engagement may be influenced materially by the fireproofing of the woodwork of a ship, and the present system of Electric fireproofing is one of the most important of the latest methods adopted for the new navy.' "

Secretary J. D. Long

The thorough acceptance of fireproofed wood by our government was somewhat retarded for a time. Secretary Herbert met with the opposition of political as well as interested prejudice, but the work went on slowly but surely notwithstanding, until a change in the administration took place in the election of William McKinley as President. No wiser choice could have been made when he selected his Cabinet than that of John Davis Long for Secretary of the Navy. Endowed by nature with great intellectual capacity, and highly cultured by education and travel; broad and keen in comprehension.

Secretary Long, who had been selected by the President because of his marked executive ability, was quick to comprehend the wisdom of the improvements that had been adopted by the Navy, and fireproofed wood was one of the first improvements he determined should remain and its possibilities developed to the utmost. He took this course with the consciousness that it was the wisest to pursue in the interest of his administration.

The war between this country and Spain taught many lessons to the world, but none greater than that of the need of absolutely fireproof battleships. The burning of Cervera's ships at Santiago accentuated the fact that inflammable wood was worse than absurd in fighting ships. There cannot be the slightest doubt that hundreds of lives might have been saved had the woodwork of the ships been treated by the Electric process. The value of such wood in the American warships was fully appreciated by the commanders and navy officials. The following from the Army and Navy Register of May 21, 1898, is evidence of this:—

> "The reports show that, in the engagement at Cardenas, the 'Winslow' was in all probability spared from total destruction by the fact that under the severest exposure none of the woodwork on her ignited. And the same conditions prevailed on board the 'Wilmington' . . . There is likely to be no stronger argument in behalf of the process than the actual demonstrations during the engagement of the present war. The disastrous effects to vessels taking part in a naval

engagement are greatly multiplied by not using fireproof wood in construction, and the dangers are minimized to an equal degree on the ships, the wood of which has been treated by this process. Among the vessels of the North Atlantic fleet on which the wood has been subjected to the Electric fireproofing process are the 'Helena,' 'Newport,' 'Princeton,' 'Nashville," 'Miantonomah.'"

Secretary Long was soon overwhelmed with claims of many processes for rendering wood fireproof. Natural woods and substitutes for wood were also offered. His determination to have only fireproof material in the construction of warships of every class was fixed, and partiality was not to be thought of; he therefore appointed a Board of Naval Officers and ordered a prolonged and severe test of all the materials submitted. In the experiments made, actual conditions were assimilated as nearly as could be, so that the tests would show how far-reaching was the protection afforded vessels by the use of this material under the destructive conditions of warfare, storms, accidents, etc.

The Final Report to the Secretary of the Navy from the Naval Constructor of the Board.

This test lasted eight months, and the final report made to Secretary Long by the Naval Constructor of the Board focusses the result of the entire series of experiments upon one process for the fireproofing of wood, and that is—"The Electric." The significant words in his report of March 9, 1899, are as follows:—

"As to the fireproof qualities of the samples tested, the Electric fireproofed wood unquestionably shows a superiority over its competitors in the record of tests.

"Finally, therefore, the result of laboratory experiments, aside from the question of electrical resistance, which represents a property in no way involved in the use of the material, seems to me undoubtedly to warrant the following conclusions:

"'That, so far as is known, there is no better process of fireproofing wood in use than that now employed by the Electric Fireproofing Company, and its continued use, for the present, at least, is advised.'"

The report of this investigation, carried on under such serious conditions, should be regarded as absolutely conclusive.

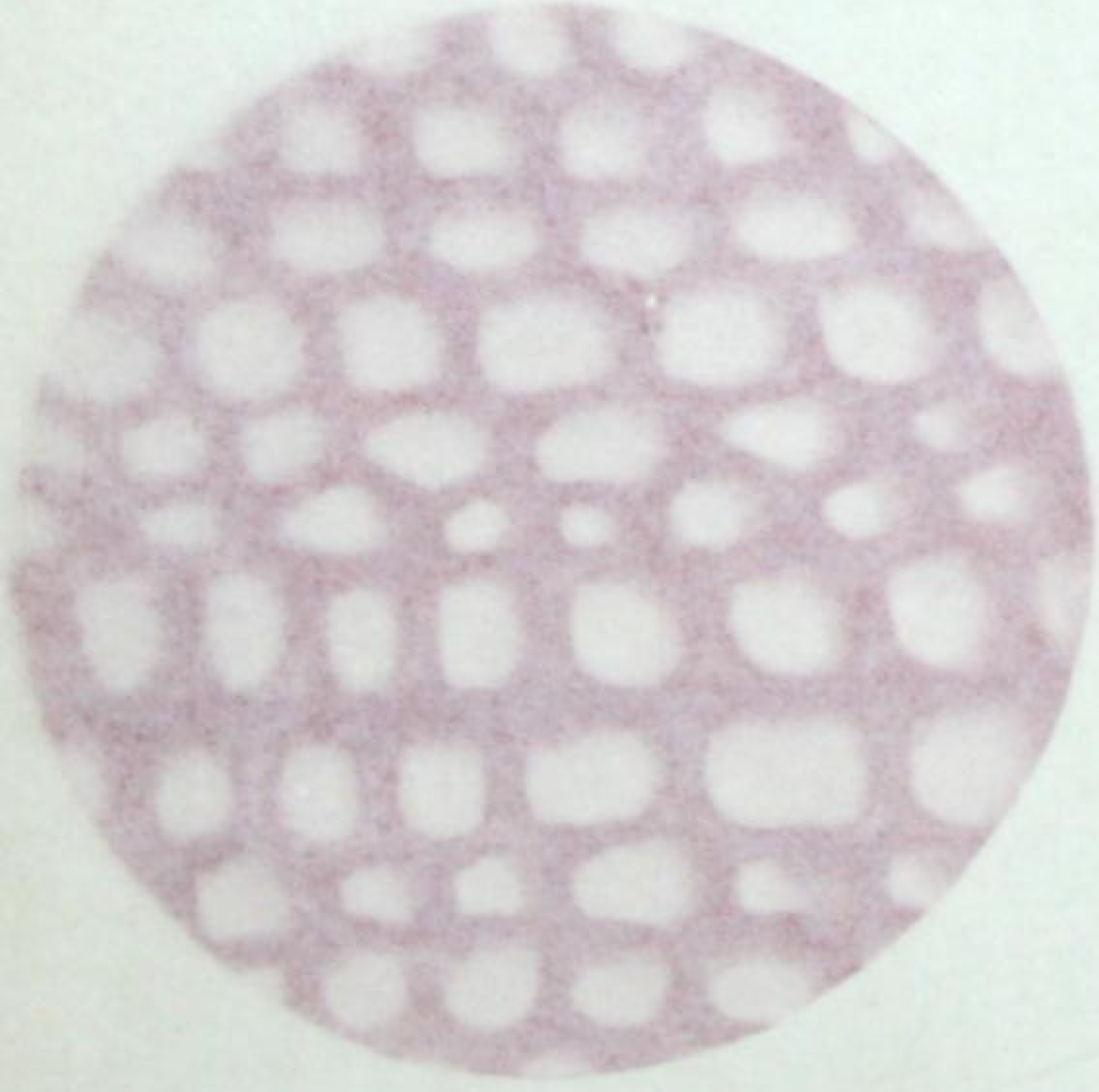
The newspaper comments on the preëminent success of the Electric process and its acceptance by the government were universally favorable. The following may be taken as an example:—

The Mail and Express, March 24, 1899.

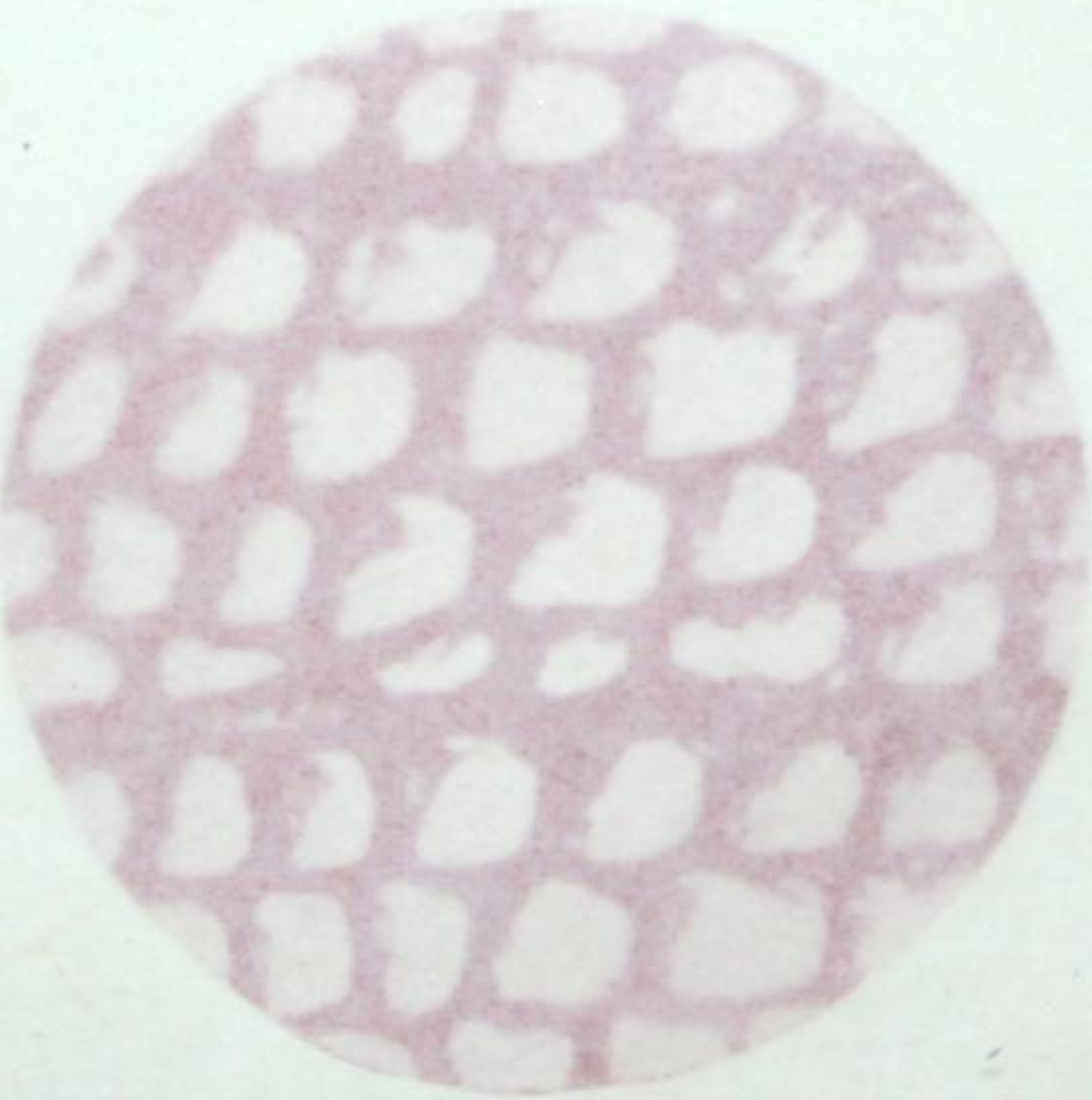
"The Electric fireproof wood used on the ships of the United States Navy is declared by a board of experts to be unequaled, and it is recommended that no other method be considered by the Department. This board for eight months investigated the processes for rendering wood impervious to fire, and to discover, if practicable, the best system of treating woodwork for vessels building for the navy.

"The sea fights in the war with Spain added nothing to the lessons derived from naval battles between China and Japan respecting the danger of woodwork to life on warships. The terrible results which followed after the woodwork of the Spanish vessels had taken fire in the engagement of Santiago and during the Manila battle were noted by naval officers present, and the conclusion was reached that many lives were lost from this cause. The board's report has received the approval of the Navy Department, and in the construction of new ships all woodwork will be treated by the Electric process."

UNDER THE MICROSCOPE.



Untreated Wood magnified 225 diameters.



Treated Wood magnified 225 diameters, showing the fire-protecting crystals.

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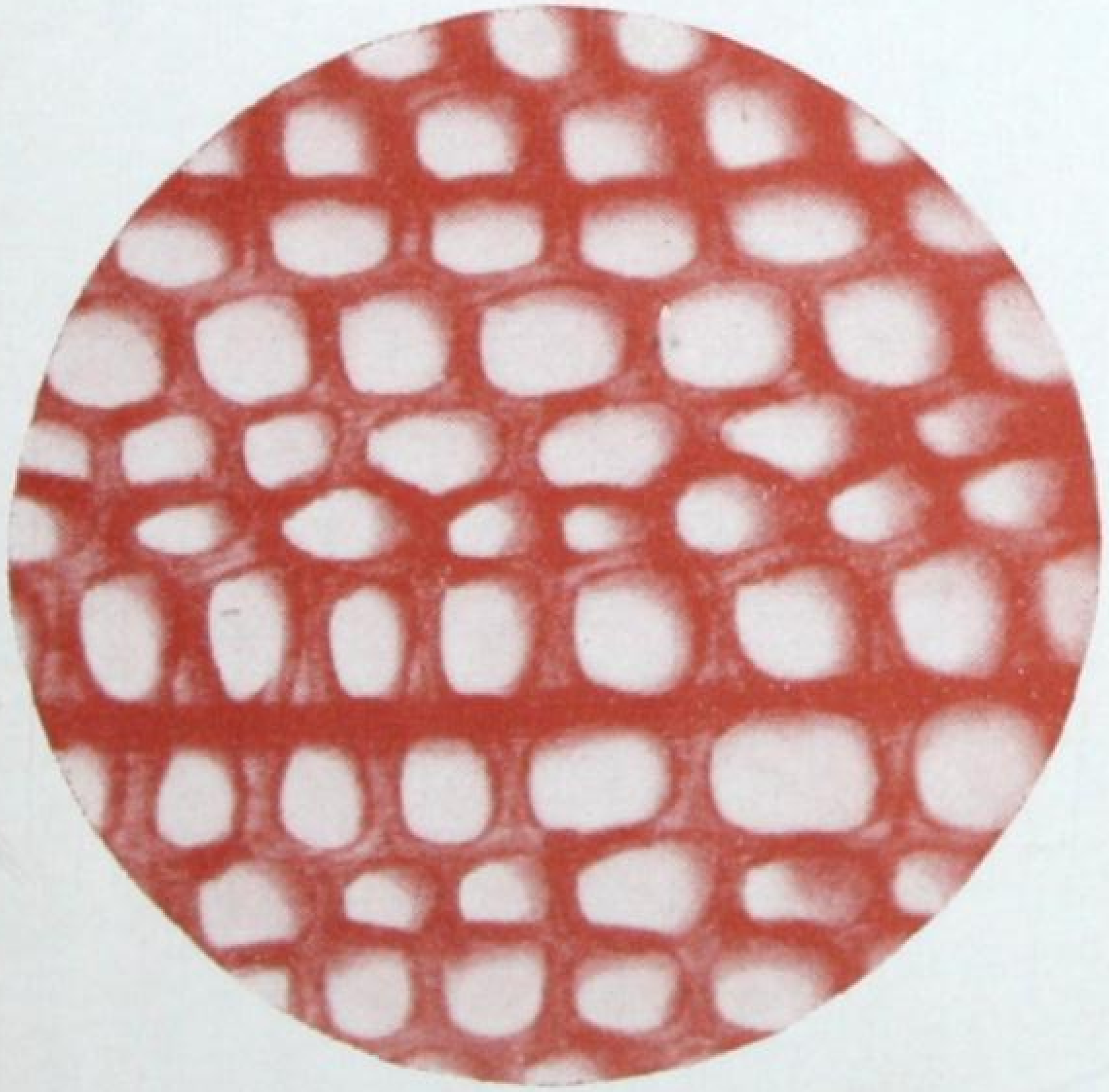
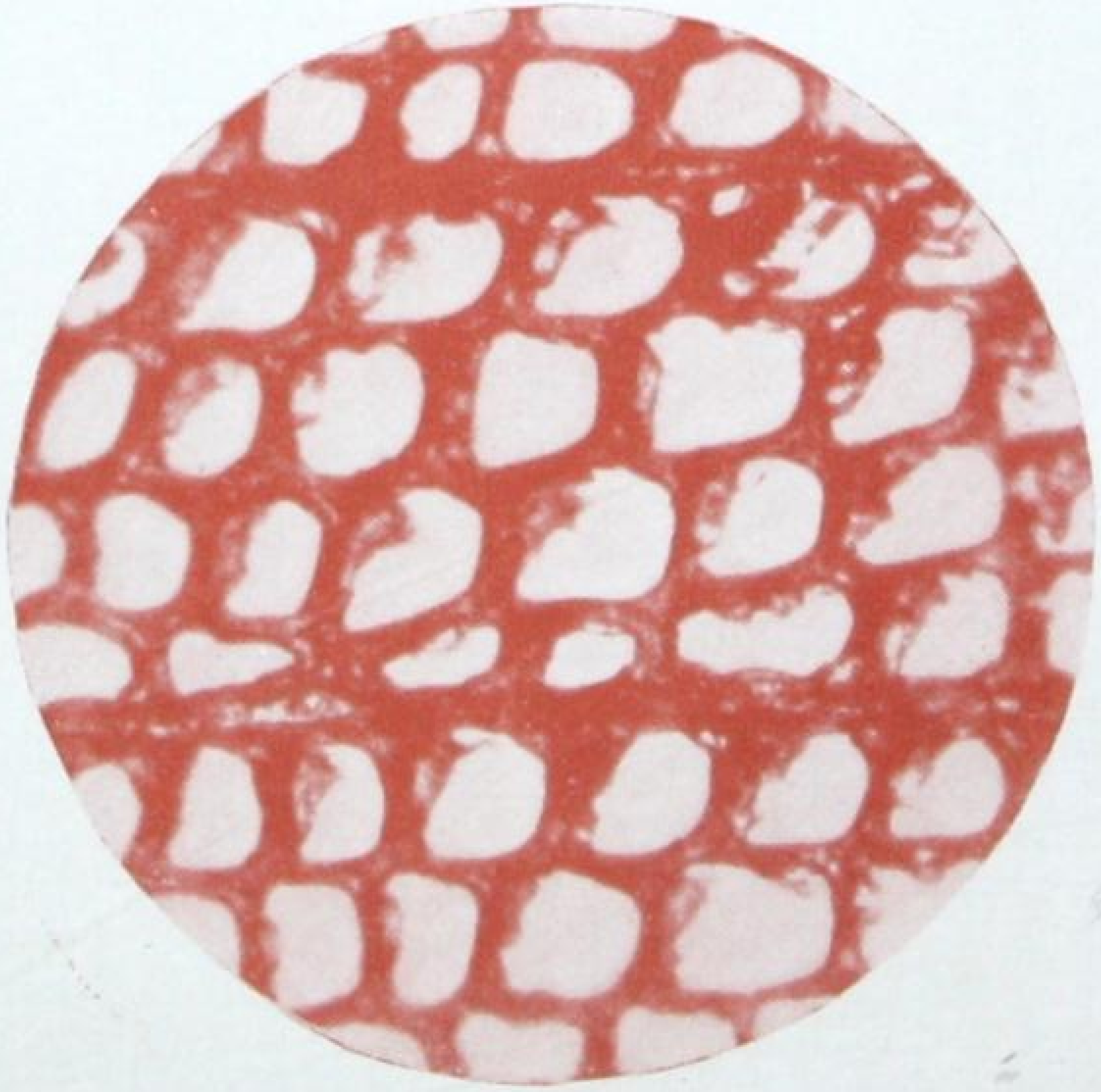


Untreated Wood magnified 225 diameters.



Treated Wood magnified 225 diameters, showing the fire-protecting crystals.

Army and Navy Journal, March 25, 1899.

"The present system of fireproofing wood used on ships of the Navy is declared by a board of experts to be unequaled, and it is recommended that no change be made or any other method considered by the Department. The board was the result of Colonel Roosevelt's efforts when Assistant Secretary of the Navy to have experts take up the fireproof wood subject in view of the opposition that was developed against subjecting wood to any fireproof treatment. It was held by some experts that some fireproof wood was as dangerous to life in battle as that not so treated. But the majority of officers, including Admiral Sampson, Admiral Hichborn and several of the bureau chiefs, were warm advocates of the wood. The board examined every known process, and concludes that the Electric process now used by the Navy is far superior to all others, and that not an inch of wood should be placed in a war vessel that is not treated by it. The sea fights in the Spanish war added nothing to the lessons derived from the Yalu fight respecting the danger of woodwork on warships. The results produced by the woodwork of the Spanish vessels taking fire, both in front of Santiago and during the Manila battle, was reported upon by the naval officers present, and a conclusion reached that many lives were lost from this cause. The board's report has received the approval of the Navy Department, which directs that in the construction of new ships all woodwork be treated by the present Electric process."

New York Evening Post, August 8, 1899.

"Government and private orders make more work than the cylinders of the Electric Fireproofing Company, big as they are, can handle, and plans are being made for six new plants, which will greatly increase the output. The company which has the British rights on the invention supplies wood for the navies of Great Britain, France, Denmark, Japan and Norway, and is at work now filling orders for the woodwork of the new yacht for Queen Victoria. One or two of the new downtown office buildings are furnished with wood thus treated, and many private houses are being built of it, as it increases the cost of construction by only 4 or 5 per cent."

A Naval Constructor's Testimony

"U. S. NAVY YARD, NORFOLK, VA.
June 6, 1899.

"*The Insurance Press*, New York City.

"GENTLEMEN.—Referring to your letter of June 2, 1899, requesting information relative to fireproof wood, I would suggest that you write to the Electric Fireproofing Company, 121 West Twenty-third street, New York City, who have an abundance of literature on this subject, and who doubtless will be glad to furnish you with the same.

"We are using fireproofed wood, both hard and soft, prepared by that company, in all work on our naval vessels. The wood as thus prepared is practically fireproof. If exposed, for a considerable length of time, to sufficient heat to ignite ordinary wood, the fireproofed wood will char but will not carry flame. So far as its fireproof character is concerned, I should consider it perfectly satisfactory.

"It has been adopted for practically all joiner work in naval vessels, and this on account of its unquestionably fireproof character.

"Very respectfully,
"A. W. STAHL, Naval Constructor, U.S.N."

Our Fireproof Warships

THE formidable array of warships of various character, which have been ordered to have only Electric fireproofed wood in their construction, since the final result of the great government test was presented to the Secretary of the Navy, tells its own story. Some of these vessels have been recently launched, but the majority of them are still on the stocks in various shipbuilding yards.

The builders and classification are as follows:—

Newport News Shipbuilding and Dry Dock Company.

BATTLESHIPS: **Kearsarge, Kentucky, Illinois, Missouri.**

GUNBOATS: **Helena, Nashville, Wilmington.**

MONITORS: **Arkansas.**

William Cramp & Sons, Philadelphia.

BATTLESHIPS: **Alabama, Maine, Iowa.**

CRUISER: **Brooklyn.**

Union Iron Works, San Francisco, Cal.

BATTLESHIPS: **Wisconsin, Ohio.**
GUNBOATS: **Wheeling, Marietta.**
TORPEDO BOAT: **Farragut.**
TORPEDO BOAT DESTROYERS: **Paul Jones, Perry, Preble.**
MONITOR: **Wyoming.**
CRUISER: **Tacoma.**

Bath Iron Works, Bath, Me.

GUNBOATS: **Vicksburg, Newport.**
TORPEDO BOATS: **Dahlgren, T. A. M. Craven, Barney, Biddle.**
MONITOR: **Connecticut.**
CRUISER: **Cleveland.**

Crescent Shipyard, Elizabeth, N. J.

GUNBOAT: **Annapolis.**
TORPEDO BOATS: **Bagley, Nicholson, O'Brien.**
MONITOR: **Florida.**
CRUISER: **Chattanooga.**

John Dialogue & Sons, Camden, N. J.

GUNBOAT: **Princeton.**

Columbia Iron Works, Baltimore, Md.

TORPEDO BOATS: **Foote, Rodgers, Winslow, McKee, Quigley.**

Wolf & Zwicker, Portland, Oregon.

TORPEDO BOATS: **Davis, Fox.**

Herreshoff Mfg. Co., Bristol, R. I.

TORPEDO BOATS: **Morris, Talbot, Gwin.**

Chas. Hillman & Co., Philadelphia, Pa.

TORPEDO BOAT: **Mackenzie.**

Lawley & Son Corporation, Boston, Mass.

TORPEDO BOATS: **Blakeley, Delong.**

W. R. Trigg & Co., Richmond, Va.

TORPEDO BOATS: **Shubrick, Stockton, Thornton.**

TORPEDO BOAT DESTROYERS: **Dale, Decatur.**

CRUISER: **Galveston.**

Gas Engine Co., New York City, N. Y.

TORPEDO BOAT: **Wilkes.**

TORPEDO BOAT DESTROYER: **Stewart.**

Neafie & Levy Co., Philadelphia, Pa.

TORPEDO BOAT DESTROYERS: **Bainbridge, Barry, Chauncey.**

CRUISER: **Denver.**

Harlan & Holingsworth Co., Wilmington, Del.

TORPEDO BOAT DESTROYERS: **Hopkins, Hull.**

Fore River Engine Co., Weymouth, Mass.

TORPEDO BOAT DESTROYERS: **Lawrence, F. O. McDonough.**

CRUISER: **Des Moines.**

Maryland Steel Works, Sparrow Point, Maryland.

TORPEDO BOAT DESTROYERS: **Truxton, Whipple, Warden.**

Brooklyn Navy Yard.

CRUISER: **Chicago.** Reconstructed.

League Island Navy Yard.

MONITOR: **Miantonomah.** Reconstructed.

In Building Construction

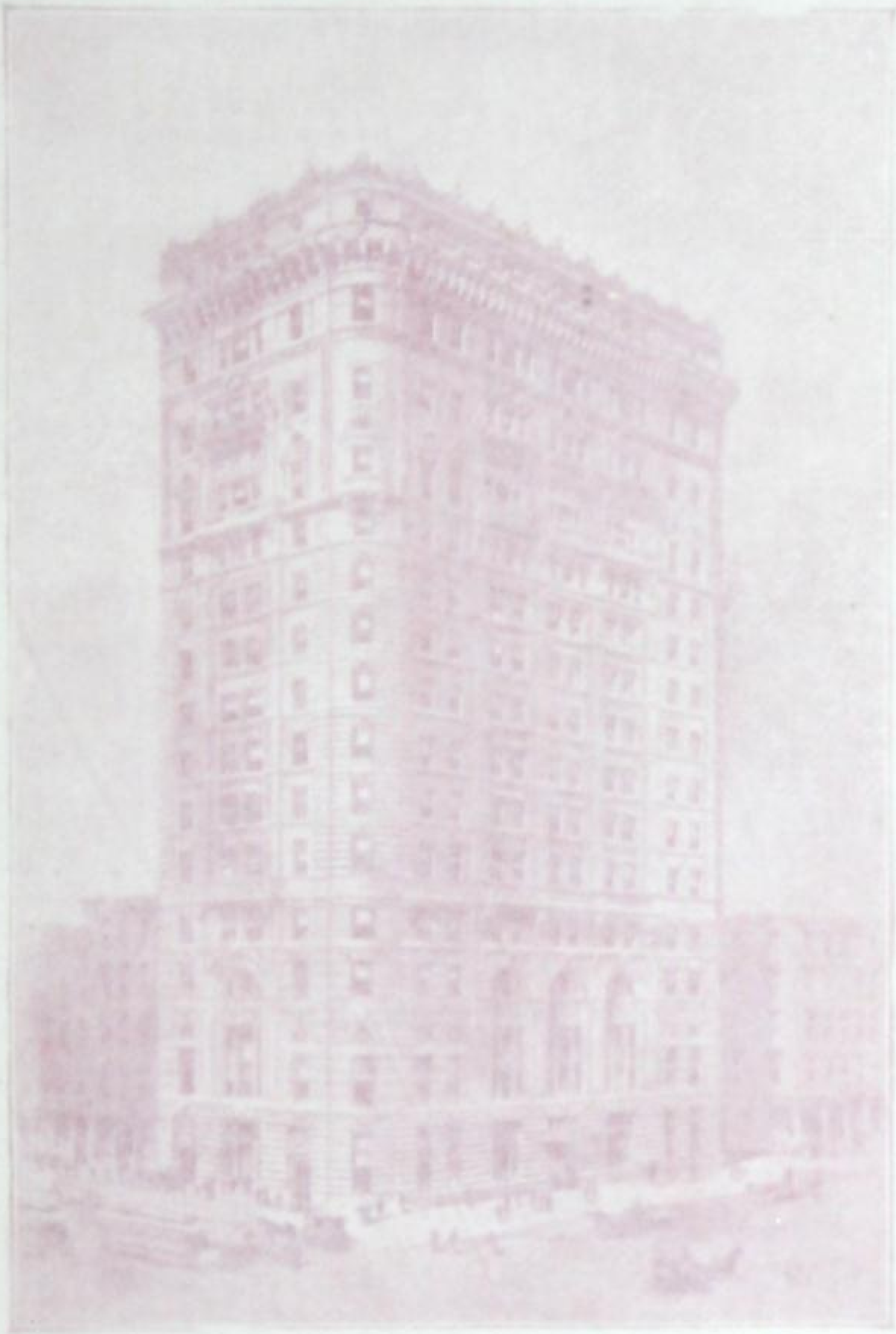
FIREPROOFED wood already enters largely into the construction of modern buildings. Several of New York's tallest modern structures are protected by it from floor to roof. Our builders of private residences are gradually recognizing its importance by including Electric fireproofed wood in the selected materials.

The Dun Building

The most notable of the modern structures referred to is the famous Dun Building on Broadway. The whole of the woodwork in this magnificent structure is of the best class, and is a reliable example of the fact that wood treated by the Electric fireproofing process is capable of *superior* finish. The building is occupied by R. G. Dun & Co., the great Mercantile Agency. The head of the house, Mr. Robert Douglass Dun, said to an *Insurance Press* reporter recently:—

"We feel perfectly safe in this building because we know it is fireproof."

"Why do you consider the building fireproof?" the reporter asked.



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The woodwork throughout this building was treated by the Electric Fireproofing Process.

" Because it is fitted throughout only with wood which has been treated by the Electric fireproofing process."

" But does the wood warp or does the varnish come off ? "

At this question Mr. Douglass arose and pointed to the woodwork in several of the elaborate offices of the building. " Look for yourself," he replied, " every panel and frame is smooth and perfect as when first put in place. The varnish or polish is just as perfect as ever. My own opinion is that the Electric process of preparing the wood vastly improves it."

" Electric fireproofed wood is destined to become a great feature in the construction of modern buildings, and it is really impossible at the present time to fully estimate its great importance."

A Calamity Averted

If a fire happens to be started in some inner office of one of the modern architectural creations when all the employees have gone to their homes, and the janitor is in a remote part of the building, there is great opportunity for disaster. This of course refers to buildings only whose woodwork has not been treated by the Electric fireproofing process. When the woodwork has been treated by this method the conclusions are entirely different.

Every tenant, every clerk, and even the janitor may go home and rest contented in the knowledge that, although all the papers and furniture in the building may burn to ashes, the wood which is part of the building will never flame, but instead, will act as a fire-retardant and render disaster impossible. No more striking illustration of this fact could be given than the actual fire which occurred in the Dun Building on March 10th last. The security afforded by the Electric fireproofed wood was carried well home to the owners of the building and tenants. Everything inflammable in the room simply burned itself out, and that was the end of it. The flames were powerless against the chemically treated woodwork, and thus a costly edifice was preserved and the true worth of the discovery accentuated in the strongest possible manner. The facts relative to this fire may be learned from an article published in the New York Daily Tribune of March 18th last, as follows :—

A Big Sky-Scraper Saved

The degree of excellence to which the fireproofing of modern buildings has been carried was shown in an astonishing manner Saturday, March 10th, in a fire which occurred in the big Dun Building, on the northeast corner of Broadway and Reade street, and which burnt itself out without spreading even so much as a foot, without harming the building beyond the remedy of a little varnish, without disturbing the tenants or alarming the fire department.

The blaze was serious enough. It was sufficient to thoroughly ignite any ordinary building and in almost any other sky-scraper it would have resulted in serious damage.

The reason the Dun Building escaped lies in the fact that all the woodwork and trim was rendered fireproof by the Electric fireproofing process at the time it was built, several years ago. This process is the same which was adopted by the United States Naval Authorities after a series of the most exhaustive comparative tests with every known method of fireproof construction in the line of material that could be utilized as wood in building of warships. This Board of Naval Officers had been appointed by Secretary

Long, to ascertain whether there was any better process known than that of the Electric Fireproofing Company. It found no better process, and the expert member of the board in his report says:—

"As to the fireproof qualities of the samples tested, the Electric fireproofed wood unquestionably shows a superiority over its competitors in the record of tests. Finally, therefore, the result of laboratory experiments, aside from the question of electrical resistance which represents a property in no way involved in the use of the material, seems to me to warrant the following conclusions: That so far as is known, there is no better process of fireproofing wood in use than that now employed by the Electric Fireproofing Company, and its continued use, for the present at least, is advised."

Since the first step in the use of this fireproofed wood was taken by the United States Navy Department, the Electric fireproofing process has been adopted by the governments of Great Britain, Russia, France, Denmark and other naval powers, exclusively, for the fireproofing of all woodwork entering into the construction of their warships.

It appears that the recent fire in the Dun Building broke out in a wastepaper basket. It quickly spread to the other furniture in the room and created a blaze that was so fierce that iron hinges were twisted and glass melted. The office had been closed, and, consequently, the fire had a good start. The woodwork in the Dun Building is extensive and elaborate, and its finish is beautiful even beyond the ordinary, and, as Manager Douglas, of the R. G. Dun Co., pointed out, it would have been not only a source of danger, but, probably, would have assisted in spreading the fire from room to room, and, perhaps, from story to story, as in similar cases, had it not been for the fact that it had all been rendered non-flammable. The result was, the fire was absolutely harmless, and was confined entirely to the combustible furniture in the room wherein it occurred.

The facts about this fire have only just leaked out, and the case is receiving the closest attention from department officials, architects and experts in the building line. This is partly due to the fame which wood treated by the Electric process has acquired because of the great naval powers having adopted it so unreservedly, and partly to the fact that only last week an extraordinary series of experiments were made in this city, which demonstrated how completely wood has been taken out of the list of combustibles and put in the fireproof class, thus removing the last source of danger from the modern building. In the recent test, which occurred on February 23d, a house built of this fireproofed wood was erected and then by means of pine logs, shavings and kerosene, subjected inside and out to a temperature of about 1,900 degrees Fahrenheit. Every bit of metal and glass in the structure was melted, of course, but the wood suffered little more than slight charring. The test was given under the direction of the Building and Fire Departments and the Board of Fire Underwriters of New York City, and the fire was started by Building Commissioner Brady personally. It was witnessed by department officials and many leading architects and builders, as well as representatives from the leading fire insurance companies, from this and other cities, prominent among others being the Mayor of Montreal, with a number of representative men from Canada. The extraordinary fire resisting qualities of the wood surprised every one who was unacquainted with this process, and the fire in the Dun Building, following so closely upon these experiments, supplies a test under actual everyday conditions, thus rounding out, on the practical side, a demonstration which surely marks a new chapter in the fireproofing of buildings.—*New York Tribune, March 18, 1900.*

The Record and Guide, of New York, also makes this occurrence the keynote of a special article on Electric fireproofed wood and the protection it affords, in its issue of March 17th last, as follows:—

Really Fireproof

In the discussion that has been carried on as to whether the extremest type of the skyscraper will continue to be built, it has been generally recognized that the nature of the answer greatly depends upon what we can say to another question—Can we build fireproof? meaning, by "fireproof," positive indestructibility under all practical conditions.

Of course a great many so-called fireproof buildings exist, yet we know from cases of actual conflagration that have occurred that the most that experience hitherto permits us to say is that while the skyscraper has exhibited under trial fireproof qualities in different degrees, none so far has proved to be fireproof in the sense of the word that satisfies the public demand for positive safety.

The notable fire in the Home Life Insurance Building, for instance, while it demonstrated in how many particulars a modern edifice is fire-resisting, revealed at the same time with equal distinctness how serious the dangers are that must be eliminated from all tall buildings before they can correctly be regarded as "fireproof."

Public Apprehension.

Probably it is safe to say that as the net result of fires in sky-scrapers public apprehension on the score of safety has been increased rather than lessened, and perhaps we are warranted in attributing to a recognition of this apprehension the fact that of late there has been a distinct decrease in the altitude of tall buildings. Certainly, none of the structures now under way reaches the extreme height of a few years ago, and we understand that today insurance companies find a much greater readiness on the part of tenants of tall buildings to take out policies.

Clearly, this is a serious matter for the owner, because the extremely high price of real estate in Manhattan necessitates the utmost utilization of space, and the wonder with many people is why architects have not given more attention to removing the obvious source of weakness in their tall buildings. This problem is particularly the business of the architect, and yet we see building after building put up with the old demonstrated dangers wilfully repeated in construction.

It is perfectly clear that the weak spot—the only weak spot—within the modern building is the woodwork. Eliminate that and scarcely another remains.

A Remarkable Instance.

How true this is was demonstrated in a most remarkable manner last week. We say remarkable because the case we refer to stands out in strong contrast to the ordinary run of such events, but as a matter of fact the result was only just what ought to happen if our fireproof buildings really deserve the title applied to them. On Saturday, soon after one of the offices had been closed, a fire broke out in the Dun Building on the northeast corner of Broadway and Reade street. The fire apparently originated in a desk or a wastepaper basket, and the other pieces of furniture in the room were quickly ignited. In a few moments there was a fierce blaze at work attacking the trim and structure of the building. This is just the situation which the fireproof edifice is expected to withstand with impunity, but, as we know, it is just the situation that usually has proved disastrous. The general course has been that the building itself has contributed material to the conflagration, resulting in an extension of the fire and serious loss.

In the Dun Building nothing of the kind happened. The furniture was consumed, but, so far as the building is concerned, it did not add so much to the blaze as the equivalent of a matchstick. This is literally the fact, although the Dun Building, as everyone who has been in it knows, is one of the most handsomely decorated office buildings in the city, and lacks nothing in the matter of woodwork for either ornament or use. Apparently the old source of danger was there in abundance, and in the room where the fire occurred trim was freely used and was fiercely attacked.

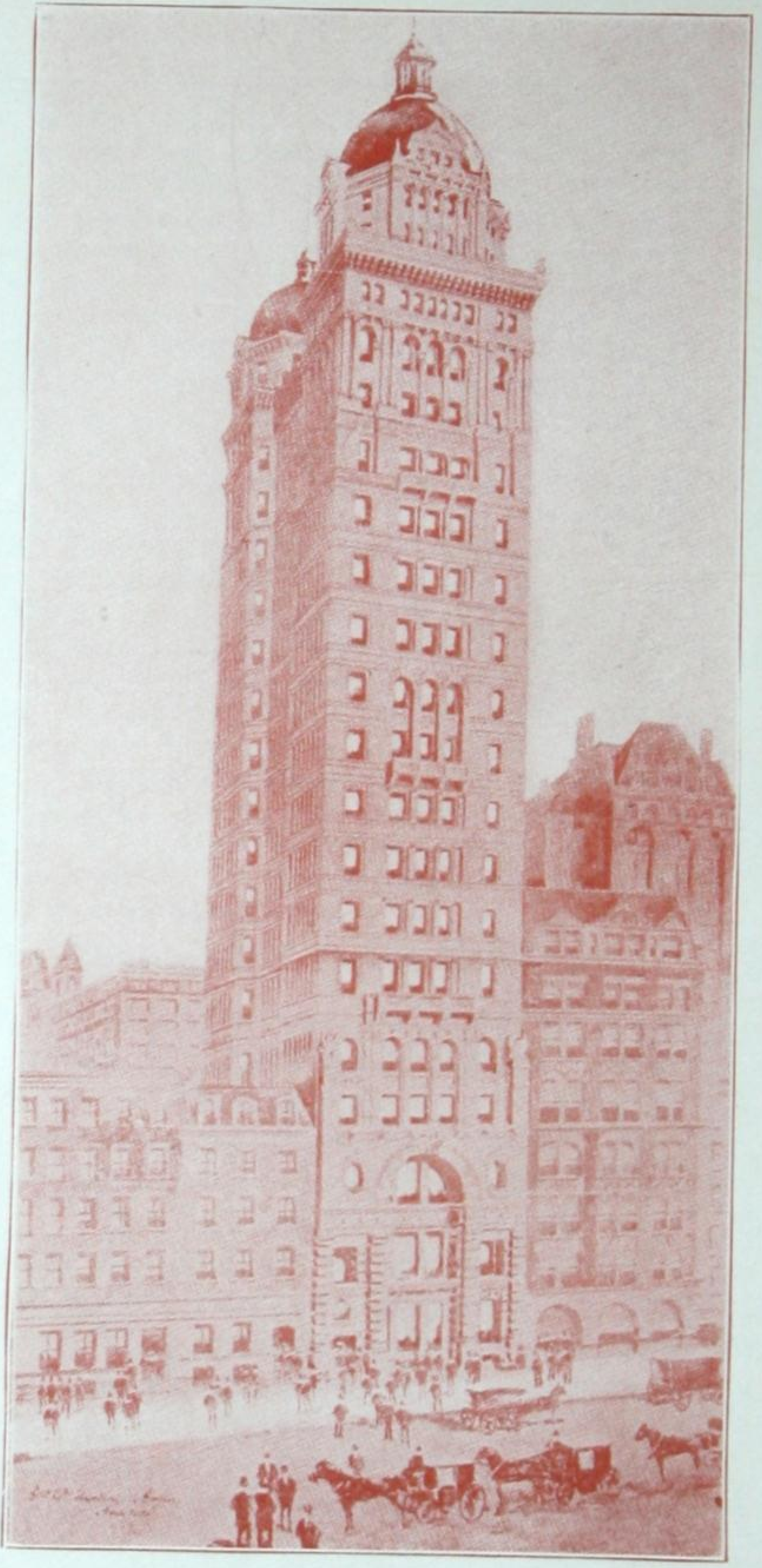
The Building Untouched.

The fire, however, was confined to the furniture, and burnt itself out as harmlessly as a fire in a grate. The tenants of the building were undisturbed, the public knew nothing of the event and even the fire department remained ignorant of the occurrence.

Now clearly this is just what the history of such an episode ought to be in a building rightly deemed "fireproof." It is perfectly absurd to apply that term to a building which needs the services of the fire department, in which lives are put in jeopardy and in which room after room or story after story is wrecked as a consequence of a chance blaze. So far as the Dun Building is concerned, the fire, serious as it would undoubtedly have been in almost any other structure in the city, amounted to nothing more than a trivial accident, which a few hours of carpenter work and a little varnish will repair; but then the Dun Building is fireproof in a fuller sense than can perhaps be asserted of any other office building in the city. Experts have believed this because, in addition to the usual safeguards, every particle of the woodwork in the structure is also fireproof. It is this fact that renders the fire in the Dun Building a contribution of prime importance to the problem of building fireproof and makes it imperative that architects and owners should take into consideration the results of

A Practical Everyday Experiment.

Fireproof wood, of course, is not exactly a new thing. It is some time since the Electric Fireproofing company solved the problem at which so many futile attempts had previously been made, and thus contributed the most valuable element to the safety of buildings. It is three years since the company applied their process to all the wood in the Dun Building. The United States, Great Britain, Denmark and the governments of other European countries, after every sort of test, have adopted the process exclusively in the construction of all their warships, yet our architects have been slow in making use of an invention that affords complete protection to life and property and adds the last justification to the use of the word "fireproof" in reference



The Commercial Cable Building, Broad Street, New York.

The woodwork throughout this building was treated by the Electric Fireproofing Process.

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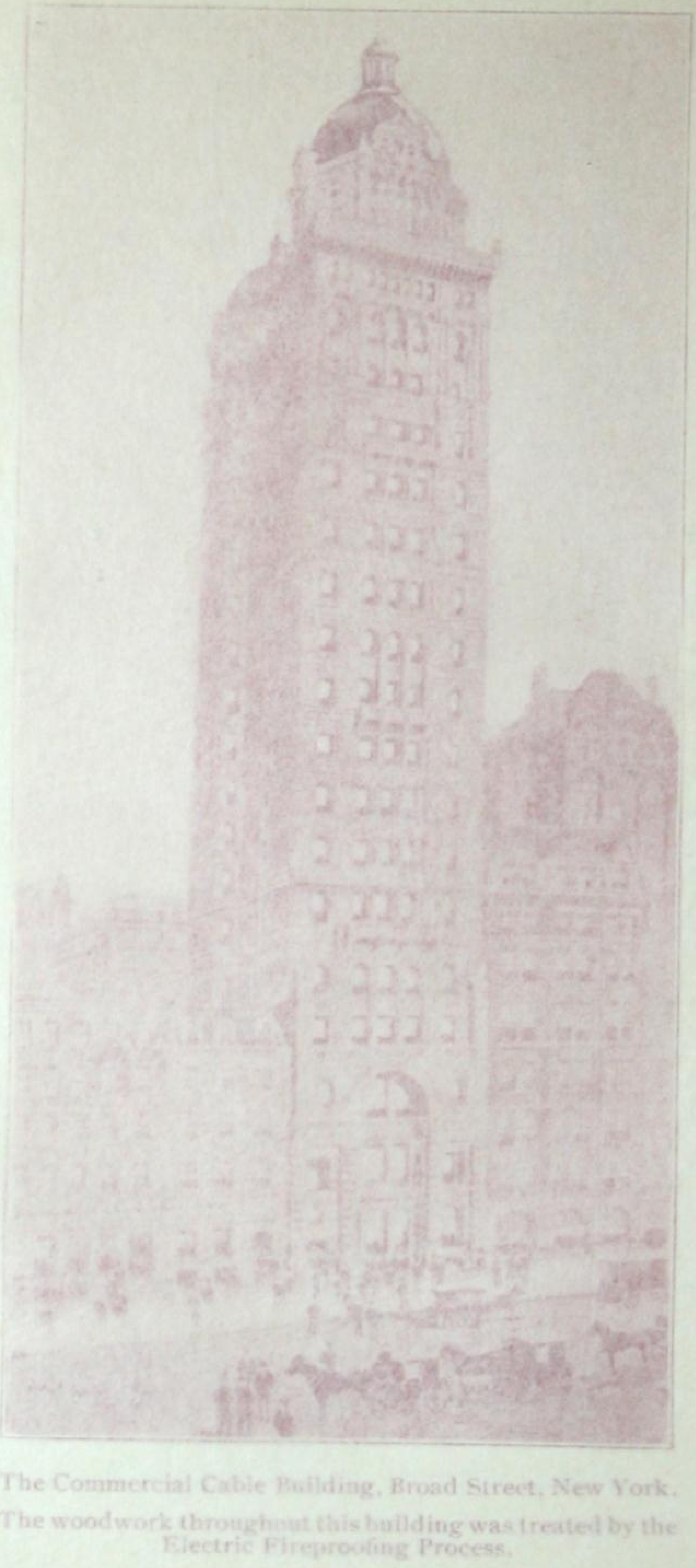
Saved from Destruction

"It is not often that an important fire passes unnoticed in New York City. It has just happened.

"Usually a fire makes a stir. The commotion and big head lines that accompanied the burning of the Windsor Hotel, the Andrews residence and the Vanderbilt country seat are still fresh in everybody's memory. The sensational aspect of these conflagrations lay, of course, in the fact that the buildings were so speedily destroyed, attended by the loss of life. As every fire teaches something, the lesson which was inculcated thereby was that all buildings nowadays should be constructed in a thoroughly fireproof manner.

"The recent unheralded fire to which we referred at the outset was important in the reverse way. Curiously, however, it taught exactly the same lesson—only it was presented from the negative point of view. Let us see what occurred.

"Last Sunday morning a fire was discovered in the basement of the Commercial Cable Building on Broad street. It occurred in a very dangerous position—in a room devoted to the storage of papers, telegraph blanks and other similar combustible material. The conditions were exactly of the sort, which, on more than one occa-



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"The result was that Sunday morning's fire, which would have been a serious matter in almost any other building in the city, was a harmless incident. Some of the contents of the room were destroyed. A closet of ordinary wood was completely burnt, but the flames spent themselves without any appreciable injury upon the incombustible woodwork of the room.

"Architects, builders and those who are experts in fire matters will recognize how dangerous a position the basement of a building is for a fire of this kind, and how easily on a Sunday morning it could spread under ordinary circumstances along the trim, until its presence was discovered—by evidences of a big conflagration.

"Surely, if ever there was a practical example, this is one of the value of fireproof wood treated by the Electric fireproofing process. It is true the value of the Electric non-inflammable wood has, over and over again, been demonstrated by experimental tests of the severest kind. It has been demonstrated so completely to the satisfaction of the United States, the British and other governments, that they have adopted it unconditionally in the construction of their warships. But here, in the case of the fire in the Commercial Cable Building, we have an accidental everyday test, sufficient to satisfy those people who like to see things proved in a 'practical' fashion.

"The result was a success, even more complete than anything that has been arrived at experimentally. The big building was saved. The actual loss was confined to a few dollars. The wisdom of the architects and owners in using non-flammable wood was justified in an extraordinary degree, and one can imagine how thoroughly satisfied in the future the tenants of the Commercial Cable Building must be regarding the safety of their lives and property.

"It is for these reasons that we refer to this fire as an important one. It possessed no sensational features, threw no lurid light like the Windsor Hotel and the Andrews fires over the entire city, but it teaches the same facts and points to the same lesson—that wood may be made fireproof, and if treated by the Electric fireproofing process it is absolutely incombustible.

Our most advanced architects and engineers are keenly alive to the importance of wood which can defy fire in building construction. If not only beams and lath are rendered incombustible, but the floors and walls, the trim and even the furniture of the home are rendered uninflammable, the awful terrors of fire will no longer assail us, and the fireman's occupation may be in jeopardy.

When the famous fire-fighter, Hugh Bonner, former Chief of the New York Fire Department, was asked whether the city would be able to reduce the cost of the fire department if the use of fireproofed wood was enforced in modern building construction, he replied: "There can be no doubt about that. There would certainly be much less use for costly fire brigades than there is now." Mr. Bonner further said that he believed that "Electric fireproofed wood was destined to become a great feature in the construction of modern buildings, and that it was really impossible at the present time to fully estimate its importance."

It may be fairly conjectured that, since the Building Commissioners have included fireproofed wood in their new code of laws, and this latest demonstration has once again forcibly reminded them that wood can be made fireproof, ere long every important modern building in the state will only have wood in its construction which has been rendered proof against flame.

What the Leading Architects say

The reporter of an important newspaper recently interviewed several of the most prominent architects of New York on the subject of fireproofed wood in building construction. We quote these interviews because they are not only interesting, but convey a fair idea of the general opinion of gentlemen who are responsible for the design and building of modern structures, and whose word cannot for a moment be questioned.

Wm. J. Fryer

Mr. William J. Fryer, member of the New York Building Code Commission, told a reporter that he considered the fireproofed wood of the Electric Company to be one of the most important factors in modern building construction, and that it could not be long before the public demand would be vastly greater than the supply.

" Have you examined the record of fireproofed wood? " the reporter enquired.

" Oh, yes, indeed. I have tested the Electric fireproofed wood in various ways and made searching investigation of its claims and how it answers them, and I am thoroughly satisfied that it is of very great importance in the building world. I have seen it in the Dun building, on Broadway, and was agreeably surprised to find that the fireproofing did not interfere with the finish of the wood. It appears to me that they have about reached perfection with it."

"Then you would advocate its use strongly?"

"Yes, personally, I would, as a matter of the greatest importance. You can quote me as being a strong endorser of fireproofed wood as a great factor in protecting life and property."

An All-Convincing Test.

"It was an all-convincing test," said Mr. Fryer when he spoke of the trial of Electric fireproofed wood of February 23, 1900. "I was simply amazed by what I saw, and really felt delighted that such a grand adjunct had been added to the most important building materials. I studied it from every point, and having learned that the wood which was attacked by the flames had been treated years before, saw that arguments relative to the enduring qualities of this particular character of treating the wood were absolutely fallacious and based upon ignorance of the conditions. By this I mean that the wonderfully ingenious method which does the work of clothing the innermost fibers of the wood so thoroughly, is not comprehended, and the permanent nature of the chemicals is not understood by those who would detract from the overwhelming importance of the subject. This transformation of wood opens up new possibilities in building which are bound to set architects all over the world thinking very seriously upon new plans in construction, besides the minor one of mere adaptation to conditions now existing. I shall not forget that test. Little did I think when

I examined the exterior and beautiful finish in the interior of that building that flames which must have reached to three thousand degrees Fahrenheit several times could not have been absolutely destroyed in a few minutes. I also examined it inside and outside when the flames were subdued, an hour and a half afterward, and found the entire structure merely charred to a greater or less degree according to the contact with the fire."

Geo. Edward Harding

Mr. George Edward Harding, of Harding & Gooch, was quite emphatic on this important subject.

" You are thoroughly familiar with fireproofed wood? " the reporter asked.

" Oh, yes, I have followed the development of the Electric process carefully and persistently, and think that if it has not already reached perfection, it is not very far from it."

" Have you used it? "

" Well, I guess so. I have had it used in the construction of three of the largest buildings in New York. The last of these is the Dun building."

" Was the wood fireproofed by the Electric process? "

" Yes; there is no other process that amounts to anything."

" Are you perfectly satisfied with the wood as you have seen it placed in the buildings you have referred to? "

" Perfectly satisfied that the Electric fireproofed wood is all right. I have learned, however, that the process requires ample time to give best results. If a contractor delays the fireproofing until the last moment, and then has it hurried through, he fails to get the hard finish he would otherwise. The Electric Fireproofing Company had their own time to fireproof the wood in the Dun building, and the consequence is that it is in perfect order. Every panel is splendidly finished, and the varnish is as smooth as when just put on."

"Have you heard of carpenters complaining that their tools were injured in working the wood?"

"Not to amount to anything. If properly tempered tools are used they find very little difference."

"Have you found that the screws or nails used in the fireproofed wood rust?"

"No, indeed; such a thing cannot happen in the wood which is prepared by the Electric Fireproofing Company when it is properly kiln dried."

"Then you are strongly in favor of fireproofed wood, Mr. Harding, and from an architect's standpoint believe that it has an important future in building construction?"

"When capitalists, who place their money in buildings of one description or another, comprehend the value of non-flammable wood, there will be no more firetraps, public or private."

Owen Brainard

Mr. Owen Brainard, of Carrere & Hastings, informed the reporter that he had become greatly interested in the Electric process of fireproofing wood.

"Have you found any other process satisfactory, Mr. Brainard?"

"No. A man brought some specimens here one day and begged me to pass an opinion upon them. I took one up which he declared was fireproofed by some new process (I forget what he called, but I know it was not the Electric), and held it in a flame which was burning at the time. Much to my surprise, it blazed up in a more vigorous manner that it would have done, I imagine, had it never been 'fireproofed' by his process at all. He was as much surprised as I was, and picked up his samples and went away, and I have never seen him since. I am satisfied that the prolonged research and exhaustive experiments have perfected the process. The result is a success and it has given us practically a new material which should be counted a very great achievement.

"Have you used the wood prepared by this process?"

"Only in a small way myself, but I examined it thoroughly in the Dun building, and from that and other investigations and tests, I am convinced that it is now possible to have really fireproof buildings."

"Would you advocate its use in modern office buildings, as well as hotels and residences?"

"Why not? It is important that the office building should be fireproof in every detail. The small extra cost of making the wood fireproof should be no barrier at all in a large and costly structure."

"Is not woodwork generally in the modern so-called fireproof buildings cut down to a very small proportion on account of its inflammability?"

"Undoubtedly. With fireproofed wood there are great possibilities in ornamental effects without increase of cost."

"Would you advocate making the use of fireproofed wood compulsory?"

"That I am not prepared to answer, but I feel sure that it will not be long before it will be used in every building of five stories and over, either by compulsion or by choice."

Preserves the Wood.

Mr. Brainard declared, however, that he was convinced by watching the effect of constant wear upon a wooden stairway built of Electric fireproofed wood four years ago, that the treatment tended to harden the wood and vastly improve its quality. "The stairway I refer to," continued Mr. Brainard, "leads to a gallery of very rare and costly paintings. The fireproofed wood was ordered by the owner as some protection in case of fire. I knew the wood was fireproof, but I was not quite certain that the steps would stand the wear caused by the constant walking up and down them of the many visitors to view the pictures. I have watched those steps closely during the past four years, and although thousands of people have passed up and down them they show scarcely any signs of wear, and moreover, although exposed to changes of atmosphere, they have never warped or shrunk, but every piece of wood is true and firm in its place as it was when the staircase was first finished. This fact convinces me that in Electric fireproofed wood the public has a new building material of very great value."

The Matter of Cost.

Speaking again of the cost of the treatment, Mr. Brainard made it very plain that he considered it great economy to use wood treated by the Electric fireproofing process in place of steel, stone, marble or terra-cotta in very many instances. "Wood," he said, "is undoubtedly the natural building material of mankind, and when rendered incombustible can scarcely be overestimated on account of its strength, natural beauty and comparative ease with which it can be worked into ornamental forms."

Major Wells

Major J. Hollis Wells, of the firm of Clinton & Russell, is one of the "up-to-date" architects of New York City. The reporter asked this gentleman whether he had considered the question of Electric fireproofed wood as a necessary factor in modern buildings.

"Decidedly, I have. I am constantly searching for inventions and improvements which can benefit me in my profession or be of advantage to clients who repose their confidence in us. I have investigated fireproofed wood, but have not as yet had occasion to use it to any extent.

. . . .

"Oh, there's a great deal too much fuss about fireproof construction. These building laws (here Major Wells placed his hand on the volume of New York building laws) give us very little scope. Architects who understand their profession thoroughly can build fireproof buildings without dictation. Where there are no air spaces there can be little danger of fire. The floors in the Home Life Building had air spaces between the beams, hence the danger."

"But in the construction of hotels or dwelling houses in the city or country, Major, would you advise the use of fireproofed wood?"

"Most emphatically, yes. Its adoption in hotels or residences should be considered absolutely necessary. People don't want houses of stone and iron altogether. Fireproofed wood in such construction becomes a necessity, and you may place us on record as advocating Electric fireproofed wood in residences."

Boring & Tilton

Boring & Tilton bear the reputation of being up-to-date in things architectural, and Mr. Boring, speaking both for himself and for his partner, informed the reporter that the Electric process of fireproofing wood was one of the greatest things of the century in the way of building construction.

"I am satisfied that the Electric process is a good one, and that the wood becomes thoroughly fireproofed by it."

"And do you advocate its use generally?"

"I would do so most strenuously if every lumber dealer and sawmill were able to supply the wood fireproofed."

L. De Coppet Berg

Mr. L. De Coppet Berg, of the firm of Cady, Berg & See, architects and engineers, informed the reporter that he had given considerable attention to the subject of fireproofed wood, and had made a careful investigation of it; and further stated that he believed the Electric process to be an excellent one, and that the fireproofed wood of the Electric company was one of the best things for modern buildings.

Walter Dickson

Mr. Walter Dickson declared that he had personally witnessed the fire-resistant qualities of Electric fireproofed wood, and that in his opinion wood fireproofed by that process is absolutely non-flammable. " Such wood," Mr. Dickson further stated, " can have no possible substitute as a fireproof finish for the interior of buildings, as well as for furniture, and I shall use it whenever I can."

Conclusions of Eminent Chemists

IN selecting the testimony of analytical chemists we have chosen only such statements as are conclusive and emanate from scientists of high and universal repute.

Professor Thos. B. Stillman

Dr. Stillman, professor of analytical chemistry at Stevens Institute of Technology, has long shown a warm interest in the fireproofing of wood, and the opinions he has given in the following interview (from the *Insurance Press*) are the result of special study of the subject:

"What is the best method of fireproofing wood, professor?" asked the reporter.

"The old and obsolete methods of fireproofing wood were by means of silicate of soda and tungstate.

"It was discovered, however, that the wood was injured both by the silicate of soda and tungstate. This was the principal reason why architects became prejudiced against the old methods and systems of fireproofing wood.

"I have gone into this thing very thoroughly, and there is no question whatever that the method nearest perfection is that of the Electric Fireproofing Company.

"This process differs from every other—not only in the chemicals employed, but from the fact that the wood is specially prepared before it is impregnated with chemicals at all.

"After such preparation it is thoroughly impregnated with phosphate of ammonia and sulphate of ammonia under a pressure of from 100 to 200 pounds to the square inch—depending entirely on the kind, character and condition of the wood.

"After such impregnation a short period of air-drying is given to the material before it is put through the kiln-drying process."

"How do the different chemicals you have mentioned act on the wood separately?"

"Why, the silicate of soda simply rots the fibre, as I have already told you. The tungstate of soda cannot possibly penetrate the wood because of the resinous matter not being removed from the wood.

"Now, I have learned by experiment that phosphate of ammonia, which is peculiarly chemical, not only strengthens the fiber of the wood, but penetrates it thoroughly.

"I have had several occasions for the verification of this—when some English capitalists (who have since purchased the rights for the use of this process in Great Britain) called upon me and expressed a doubt as to the wood being impregnated to the center in the process.

"Well, we had an interesting experiment extending over six months. Woods treated by the Electric fireproofing process were subjected to both a long air-drying and a severe kiln-drying test.

"Both specimens of wood—the kiln-dried as well as the air-dried—showed as high mechanical tests as they did before treatment. This proves that the treatment does not affect the wood. When sawed into pieces they were found to be impregnated to the center in the most thorough manner."

"Do you know the opinion of Mr. Henry Morton, president of Stevens Institute?"

"Yes; it is as clear and emphatic as my own, which you will find by referring to his letter addressed to the Electric Fireproofing Company on May 5, 1898."

The letter Professor Stillman refers to is as follows:—

"STEVENS INSTITUTE OF TECHNOLOGY,
"HOBOKEN, N. J., May 5, 1898.

"*Electric Fireproofing Co.*

"Gentlemen.—In reply to your letter of the 3d, inquiring as to the permanency of the protection from fire afforded to wood by your treatment, I would reply that it is certainly permanent. The substances with which the wood is treated and which render it non-flammable are fixed and non-volatile, and will remain in the wood and give it protection for all time.

Very truly yours,
"HENRY MORTON, President."

Each of the following reports bears its own evidence of the thorough investigation which Electric fireproofed wood had undergone before the opinion was given:

Redwood & De Hailes

Analytical and Consulting Chemists.

"LONDON, W. C., March 4, 1897.

"The process for rendering wood incombustible consists essentially of two parts, which respectively comprise the removal of the natural juices of the wood from the woody cells and vessels and the application of chemical preparations to the emptied and cleansed interstices.

"Both of these objects are effected by means of alternate exhaustion and steam treatment, the chemicals being forced into the wood at an elevated temperature. Subsequently the prepared wood is thoroughly dried.

"*Compared with Ordinary Wood in its General Utility.*—It does not appear to be more difficult to saw or plane, and has no extraordinary effect upon the tools used. It is also equally capable with ordinary wood of receiving a high polish.

"*Permanence of Impregnation.*—Owing to the fact that the chemical preparation is not merely superficially applied, but forced into the pores of the wood, the treatment is of a permanent character, and the lapse of time cannot diminish the incombustibility of the wood. Stability and non-volatility mark the chemicals employed, and even at a high temperature their tendency is to fuse, and thus add another protection to the fibers they surround.

" *Test of Incombustibility.*—To test its incombustible nature, wood of different varieties was subjected to somewhat severe ordeals, with the following results:—

" The varieties employed included yellow pine, pitch pine, birch, mahogany, cherry and oak.

" An ordinary gas flame was allowed to play upon a shelf of one-inch yellow pine. The wood charred and then glowed, having the appearence of being at a red heat, but no ignition occurred. A card placed on the shelf immediately above the heated portion suffered no change until after the lapse of two hours, when the wood had become eaten through. The hole made in the shelf was confined to the spot above the gas flame, and the wood in proximity to the hole was unaffected.

"Splinters of the treated woods were not kindled when held in the flame of a Bunsen burner, and carbonization only ensued on placing pieces in the fire.

"Some ordinary firewood was saturated with paraffin oil and heaped upon a board of treated pitch pine and then set fire to. The pitch pine did not inflame, and local carbonization was the only result. Red hot coals dropped on to the treated wood produced merely local charring. In no experiment undertaken for the purposes of this report was it possible to cause the wood to inflame. In each case the results were identical, viz., local carbonization only.

" Wood thus treated is therefore rendered practically uninflammable.

"T. HORNE REDWOOD,
"A. J. DE HAILES."

Dr. John Atfield, F.R.S.

Former Professor of Chemistry to the Pharmaceutical Society of Great Britain, Etc.

" I have examined specimens of the 'Non-Inflammable Wood' prepared by the Electric Fireproofing Company, of New York, comparing them with untreated specimens. All the samples, treated or untreated, were pieces of boards, sixteen inches long, four inches wide, and three-quarters of an inch to an inch thick. They were labeled 'mohogany,' 'cherry,' 'yellow pine,' 'pine,' 'oak (American),' 'birch'; one piece of each untreated, one piece of each treated.

"I cut splints indifferently from the outside or inside of each slab, placed a treated and an untreated splint side by side, and subjected each pair of treated and untreated splints to heat applied in various ways.

"All the untreated splints burst into flame, and burned in the manner familiar to everybody, the flame spreading with the usual rapidity from one part of the splint to another.

"Pairs of splints were placed on a flat plate of tin, which was heated from beneath. The untreated pieces of wood at once caught fire and burned in flames; the treated pieces simply charred, they did not burst into flames.

"The flame of a lucifer match readily ignited an untreated splint, which then continued to burn as usual.

"The flame of a match applied to the end of a splint charred the extremity, but when the match was consumed the charring immediately ceased, and the splint could not be made to burn of itself. In short, placed in any flame the treated wood begins to char and burn, yielding combustible gases, which afford a flame like the flame into which the splint is plunged, but the moment the splint is withdrawn from the original flame its own flame ceases.

"In other words, this treated wood is only combustible when its combustion is assisted by other non-treated combustibles; it can only be made to yield flames when heated by other flames; it is only slowly combustible; it is not inflammable, in the ordinary meaning of that word. The term *Non-Inflammable* is perhaps the only one available for expressing the character of this treated wood, for it does not of itself burn with flames, and hence the conflagration of a dwelling, factory, or ship, in the construction of which it alone is employed, would be almost impossible.

" On analysis the treated wood furnished far more phosphates, sulphates and calcareous substances than were present in the untreated specimens, and these were apparently the protective materials employed. They had been forced through the whole of the wood, for splints carefully cut from the middle of the boards were as non-inflammable as splints from the outside.

" The ash of the untreated wood was light and pulverulent, like ordinary wood ash. The ash of the treated wood was a vitreous or glass-like clinker; whence I formed the opinion that the explanation of the relative non-inflammability of the treated wood was to be found in the formation of an incombustible mineral glaze or glass-like varnish over the unburned or charred portions of the wood, this glaze or varnish greatly retarding the fire-feeding action of that indispensable supporter of combustion, namely, the air.

" The protection is permanent.

" JOHN ATFIELD."

March 8th, 1897.

Stillwell & Gladding

Chemists to the New York Produce Exchange.

NEW YORK, January 23, 1895.

" During the past six months we have made a careful examination of your patent fireproofing process, and report as follows:—

" The chemical compound used in your process is of the highest efficiency as regards fireproofing properties.

" This compound is permanent and fixed in its nature. Wood that has been treated by your process will remain permanently non-combustible; there will be no deterioration in this respect by lapse of time or difference of climate.

" Your process not only renders wood non-combustible, but also has a valuable preservative action. Wood that has been treated by your process will be largely protected from dry-rot, insects, worms, etc.

" STILLWELL & GLADDING."

The Process of Fireproofing

Editorial Comment

CONSIDERING the rapid growth of the demand for Electric fireproofed wood both at home and abroad, some information regarding the chemistry and mechanical part of the process may not be considered out of place.

One of the editors of the New York Evening Post, who recently visited the Electric fireproofing plant at Avenue B and 19th Street, New York, describes what he saw, as follows:—

For American Warships

"All the wood which has been used in the construction of United States battleships, cruisers, and torpedo boats for the last four years has come from a single little yard on the East River, filled with great piles of boards that look as if they had been washed ashore from some wreck after floating for months, until they were soaked with brine. Their weathered appearance is due to the fact that they have been subjected to a fireproofing process by which the moisture has been driven out of the pores of the wood, and certain sulphates and phosphates of ammonia forced in. As seen in the yard, they are stacked up for several months air-drying. After that no heat or flame can destroy them.

"The manager of the fireproofing works, by way of illustrating the efficacy of his methods, will take a piece of the wood and toss it into one of the big furnaces, and a bed of white-hot coals that would easily melt iron. Taking it out ten minutes afterwards, one finds it to be charred to a depth of one-sixteenth of an inch or so, but it does not carry the ghost of a flame or spark, nor a thread of smoke. Split open, it shows clean white wood from surface to core, not a fiber injured by the heat to which it has been subjected.

"Though conducted on a wholesale scale, the process is a delicate one, and is watched at every stage by the manager, who is also the inventor and perfector of the process, with as jealous care as a housewife watches her preserving kettles. This care is necessary to make good the boast of the company, that their process is the only one which does not impair the strength of the wood, or render it unfit for shellacking or polishing. A few degrees too much heat, or a few pounds too much pressure would destroy the fiber of the wood. Too low a heat or pressure and the process would not be thorough. The amount of pressure necessary varies from 80 to 120 pounds to the square inch, according to the kind of wood which is being treated. A close grained wood like mahogany not only can stand more pressure than pine, but requires it in order to force the solution to the core of the thick planks. The manager must know just what pressure each wood requires, and, what is more, he must see that it gets it. 'My engineer is a good mechanic,' he says, 'but I don't trust him in this case. Where a mistake means the ruining of thousands of feet of valuable lumber, I prefer to keep an eye on things myself.'

"So he watches the pressure-gauges when he is at the works, and inquires hourly by telephone when he is away. When the little cars of steaming planks are drawn out of the cylinders, he stands by slicing off a chip here and there with his knife, examining it with a knowing eye, tasting it, and pulling it into shreds. Then he goes to a pair of scales and has the workmen bring him sample planks from the various cars. Many of the planks are weighed before they are treated, and their weight is stamped on them. They are weighed again and measured, and the manager calculates whether, when they are dry, they will contain six ounces of the fireproofing solution to the foot. When the planks first come out of the cylinders they weigh nearly twice as much as when they went in. One or two planks are sawed completely across, to see that the solution has permeated the entire fiber."

The Engineering News

One of the leading engineering journals of New York is the Engineering News, and the following extracts from a succinct article which appeared in that journal November 18, 1898, contain reliable information on the subject of fireproofing wood:

"The employment of fireproof wood on so extensive scale as is contemplated in the recent orders of the naval authorities is sufficient to make a description of the method of its preparation of interest to engineers, and we have collected from various sources such information of practical interest as is available concerning both the process of fireproofing and the actual fireproofness, durability, strength, etc., of the wood after undergoing this process. It is also apparent that if fireproof wood shall prove to be what it is claimed to be, viz., non-inflammable, with its strength and durability and the various other qualities of the natural material uninjured, naval construction is evidently only one of many fields of usefulness. In timber construction generally, and in fireproof building construction particularly, the advantages of such a material are many.

" The end which is sought in fireproofing wood is not merely to render it non-inflammable, but to do this without injuring its structural and decorative qualities. To preserve the strength, elasticity and life of the wood its cellular structure must not be broken down or injured in the process of filling the cells or pores with the fireproofing liquid. This requires a thorough knowledge of the age, texture, condition, etc., of each kind of wood treated, for all these things affect the strength and toughness of the fibers, and, therefore, their resistance to injury. To fill the pores of a crooked-grained, gnarled piece of oak with the fireproofing solution is an entirely different task, for example, than filling pores of a straight-grained stick of white pine; the quantity of solution required is different, the pressure necessary to force it into the wood is different, and the preliminary processes of saturation and evaporation likewise differ.

"The first work in the process of fireproofing wood, therefore, is to sort the timber according to its various natural and acquired characteristics. This being done, it is put through the successive treatments of saturation, evaporation, impregnation and kiln-drying, with such particular characteristics of manipulation as previous experiment and experience have determined to be necessary to secure the best results for wood of its kind and condition. It will be seen at once that the success of fireproofing wood depends largely upon the intimate knowledge of woods and experience in their treatment which the operator possesses.

. . . .

"The fireproofing material contained in the wood is solid and non-volatile, and the fireproof quality of the wood is therefore claimed to be permanent. Even by long continued soaking, it is stated, the fireproofing material is not injured or withdrawn. The material is also claimed to have no injurious action upon paint or varnish or upon nails driven into or hardware attached to the wood, provided it is thoroughly dried.

"The plant at which the fireproofing of wood for the new battleships is being done is located on the East River front, between 19th and 20th streets, in New York city, and is owned by the Electric Fireproofing Company, which controls the process."

From the Electricians

of the

American Bell Telephone Co.

THE use of Electric fireproofed wood in switchboards is now considered a *sine qua non* with the officials of the American Bell Telephone Company.

The Chief Engineer of this company, Mr. Joseph P. Davis, when interviewed by a reporter of the *Insurance Press* at his New York office recently, declared himself emphatically in favor of fireproofed wood. Mr. Davis said: "While I have no personal knowledge of the switchboards in which the chemically treated wood has been used, I can say that I advised its use strenuously. I was convinced of its fire-retardant and noninflammable qualities by the evidence contained in the reports of exhaustive tests made by my assistants, Mr. C. J. H. Woodbury and Mr. L. F. Rice. Furthermore, I have read all the literature I could gather upon the subject during the past three years. I am so strongly in favor of the fireproofed wood that I have urged its use not only in the making of switchboards, but in the construction of the annex to the American Bell Telephone Building in Boston."

Mr. C. J. H. Woodbury

Mr. Woodbury is an expert electrical engineer of high repute in his profession, and his opinion is considered to be especially important. When the reporter called upon him at the Boston headquarters of the company, and asked whether he had advocated the use of fireproofed wood in switchboards, he replied with emphasis: "I have, decidedly. I have ordered its use whenever I could during the past three years. So far, we have used it only in switchboards, but now we are about to use it in the construction of the annex to this building."

"How did you become convinced of the fireproof qualities of the wood?" the reporter asked.

"Well, first of all, by experiment. I was somewhat dubious at first and could accept no hearsay evidence as to the virtues of the Electric or any other process; the matter was too serious. I and my colleague, Mr. L. F. Rice, who is an expert engineer and architect, experimented for thirteen months with various examples of wood which had been treated by the Electric process. Our confidence grew step by step as we saw that the claims made for the wood were justified."

Mr. L. F. Rice

At this point Mr. Woodbury introduced Mr. Rice to the reporter and explained the subject of conversation. Mr. Rice very quickly became enthusiastic and explained in detail many of the experiments they made in order to test the treated wood before recommending its adoption.

"Naturally," said Mr. Rice, "the first desire we had was to convince ourselves of the non-inflammability of the wood, for this was the principal quality we were in search of. We procured from the Electric Fireproofing Company, of New York, samples of mahogany, oak, ash, cherry and other woods which had been chemically treated. We also had duplicate samples made of ordinary untreated wood. These pieces were cut to the same dimensions as the treated samples. Our experiments were various, prolonged and exacting. Under the blowpipe we found the *untreated* wood was consumed almost immediately, while the *treated* wood was only slightly carbonized after ten minutes under a temperature which would have registered 3,000 to 4,000 degrees Fahrenheit. In the ordinary gas flame (without the blow pipe) the *treated* wood was only slightly charred after having been in full contact with the fire for over an hour, while the *untreated* wood flamed and was consumed altogether in a few moments. However we varied the experiments, the immense contrast was the same. There was only one conclusion to be drawn, and that was—that the treated wood was entirely transformed so far as its inflammability was concerned, and the ordinary wood in its natural state was not for a moment to be compared to the treated wood as a building material. The treated wood is eminently satisfactory, and the great value arises in the fact that, although wood, it is almost as non-inflammable as stone."

"Are you satisfied as to the permanent nature of the Electric fireproofing?" asked the reporter.

"Yes. We exposed many specimens of the treated woods to various atmospheric conditions for over a year. We allowed them to remain in the rain, in the frost and snow, and also through the heat of the summer; but all the same when we tested them we found that they were impervious to flame as were the samples which came fresh from the Electric Fireproofing Company's works."

"Have you had complaints from any one regarding the wood?"

Mr. Woodbury replied: "The only complaint we have had comes from some of our workmen. They say that the treated wood is hard and tough and takes the edge off their tools somewhat. I know, however, that the fault lies with the tools and not with the wood. They must get tools with a higher quality of steel. The very fact that the treated wood is harder and tougher than the natural is greatly in favor of the Electric treatment."

"Are you aware that there are other alleged processes of fireproofing, Mr. Woodbury?"

"I have heard something about them, but that sort of thing always happens when, after years of research, a man succeeds in an invention or discovery. The moment his success is acknowledged, imitators spring up all around and declare that they discovered it long ago. Oh, no, we are not carried away by pretentions. The facts connected with the transformation of the wood prove to us conclusively that such wonderful results could only have been achieved by years of study and experiment. We are thoroughly satisfied that the Electric process is all we desire, and we have no time to waste on pretenders."

Accepted by the New York Building Department

ARCHITECTS who have gained a just reputation for their excellent and advanced ideas in building construction speak seriously of the future methods of erecting fireproof structures when they contemplate the immense possibilities in electric fireproofed wood.

The fact that wood of all grades and dimensions can be reliably and permanently fireproofed by this ingenious process is the admitted solution of a problem which has baffled the science of ages.

The advanced governments of the world have one by one adopted this process for the wood in their warships, and it is but in the natural order of things that the building departments of our great cities should foresee in this new building material the reasonable possibility of considerably minimizing the annual destruction of life and property by fires. That the building department of the foremost city in the world should be the first to investigate and satisfy itself regarding the facts and then to adopt the Electric fireproofed wood is not to be wondered at, although it is to be congratulated on its alertness in the public interests.

In order to assist the department in its investigations, the Electric Fireproofing Company offered to submit their process to the most exacting tests which the experts of the department might suggest, and on the 29th of December last the following letter was addressed to the governing board:—

December 29, 1899.

To the Honorable Board of the Department of Building, New York City, New York,

Dear Sirs: We, the Electric Fireproofing Company, of New York City, respectfully request that under the direction of your Honorable Board, a test may be made of wood rendered fireproof by the Electric Fireproofing Process, so that the results of the test, with all the evidence therefrom, may be recorded and filed at the Department of Buildings of this city, and also that our method of treating wood to render it fireproof may be approved for use in building construction in New York City, where fireproofed wood is called for.

This company is the owner of a process for both the fireproofing elements and the mechanical method used in the treatment of wood to render it incombustible. The material or chemicals used in the course of treatment are phosphate of ammonia and sulphate of ammonia, and these ingredients are of a neutral character, neither of them being of the nature of alkali or acid, which latter are injurious to wood-fiber.

It has been demonstrated that the chemicals used in the treatment of wood by this process are calculated to preserve such wood to a large degree.

The Electric Fireproofing Process has been adopted by the United States Government exclusively for the construction of all woodwork entering into battleships, cruisers, gunboats, torpedo boats and torpedo-boat destroyers for the navy. It has also been adopted by the British

Government for similar purposes, and is now being extensively used in London, England, in a number of prominent buildings, amongst others in the new addition to the British Museum, the Crystal Palace, the Bedford Grammar School, in Mr. Charles Wyndham's new theater, by Messrs. Wallace & Co., furniture manufacturers, and has also been used for the treatment of all wood entering into the construction of the Queen's yacht. This process has also been adopted by the Danish and French Governments.

In this city our material has been used in several prominent office buildings, one of which is the R. G. Dun Building, Reade street and Broadway, for which all the wood was treated by our process before entering into construction.

The American Bell Telephone Company has been using this material for the past three years, and are using it at the present time for switchboards, etc.

Extensive tests have been made to test the non-flammability, strength and general characteristics of wood after treatment by this process, and we send herewith record of such tests by the Stevens Institute of Technology.

We also send herewith a copy of the report made by the British Fire Prevention Committee, No. 36, of tests with wood treated by this process in London. We would ask you to kindly preserve this copy for us after it has served your purpose, and remain,

Very respectfully,
ELECTRIC FIREPROOFING COMPANY,
Per Max Bachert, Vice-President.

The offer was duly accepted, and on the 23d of February the test took place as fully described on preceding pages 39-49.

On the 31st of May, 1900, the president of the Board of Buildings announced the approval and acceptance of the Electric process by the New York Building Department in the following letter to the Electric Fireproofing Company:—

Department of Buildings
for the Boroughs of Manhattan and the Bronx
No. 220 Fourth Avenue,
S. W. Corner 18th St.

New York, May 31, 1900.

Dear Sirs: Your application of December last, expressing the desire to conduct a practical test of your fireproof wood, was duly received.

In reply thereto I beg to state that the matter was referred, through the Board of Buildings, to Mr. Wm. W. Ewing, one of the engineers connected with this Department, for the purpose of making a thorough examination into your process of fireproofing wood and the application of same to buildings.

The construction of the test structure tested on February 23, 1900, may be briefly described as follows:—

A small frame structure 12 feet 4 inches by 18 feet 5 inches and 16 feet 4 inches high, divided into two rooms, had a cupola in the center 3 feet 2 inches by 6 feet, extending 10 feet 9 inches above the top of main structure, which was also divided in the center, making a separate flue for each room. One of the rooms was left with the studding and rafters exposed, while the other had a mantel fireplace and panelled sides and ceiling, exhibiting the various finishing of the different kinds of wood used in trimming fireproof buildings. The structure was built at the foot of Nineteenth street and East River, and on day of test was placed on a barge, the floor of which was protected by three layers of 1 1-8-inch mahogany, and was towed to foot of Eighty-sixth street and East river, where test was made.

On the day of test a small quantity of fuel was kept constantly ignited in the fireplace, and burned for several hours, with the effect of charring a small hole through the lower part of mantel back.

Fuel, consisting of shavings, pine cord-word and barrel staves, all being saturated with kerosene, was placed on top of the barge beneath the first tier of beams of the unfinished room, and being lighted and fire re-kindled from time to time, burned for thirty-five minutes.

Fuel, same as above, was also placed in the unfinished room next the partition, and being lighted and fire re-kindled from time to time, burned fiercely for twenty-one minutes, after which time no flames were seen issuing from top of cupola, and the interior gradually cooled, leaving the wood charred. The building practically remained intact at end of test.

The various stages of this test by fire were witnessed by the following officers of this Department: Thomas J. Brady, President Board of Buildings, and Commissioner of Buildings for the boroughs of Manhattan and the Bronx; John Guilfoyle, Commissioner of Buildings for the Borough of Brooklyn; Daniel Campbell, Commissioner of Buildings for boroughs of Queens and Richmond; John A. Dooner, Superintendent of Buildings for the boroughs of Manhattan and the Bronx; Eugene Otterbourg, Assistant Corporation Counsel, assigned to the Department of Buildings; William J. Fryer, Cornelius O'Reilly and A. F. D'Oench, of the Board of Examiners; and also by Engineers William W. Ewing and Thomas W. Lamb, who made careful notes of the fire test, as well as the different kinds and disposition of lumber used in the construction.

From the results of the test as made, and from reading the reports on file in this Department, I am of the opinion that wood treated by your process is a fire preventive, and may be used in buildings, in accordance with Section 105 of the Building Code.

Yours respectfully,
(Signed) T. J. Brady,
President of the Board of Buildings.

To the Electric Fireproofing Co.,
New York City.

"PARAMOUNT"

"The record of Electric fireproofed wood is unparalleled in the world's history of invention. In the short space of five years the process which produces such marvelous and substantial results as to render wood non-inflammable, has advanced from the criticized and experimental stage, to one of the most valued and valuable perfected adjuncts to the naval power of the leading nations of the world.

"The Electric process today stands paramount over every method which has ever been put forth to produce similar results. It has been tried to the uttermost, and has not been found wanting, but instead, it has been proved to be one of the most genuine discoveries of the nineteenth century.

"The insurance companies may eventually lower their premiums very largely and yet make profit, whilst the taxes of every town and city may be reduced because a costly fire brigade will not be necessary.

"Finally, it may be stated that while many alleged processes for fireproofing wood have come and gone in the past few years, the Electric process from its inception, has advanced step by step, and is today used exclusively for the treatment of all wood ordered fireproofed in the construction of warships, not alone for the United States Government, but for the British and other European naval powers."

—The Insurance Press, May 9, 1900.

Press of VECHTEN WARING
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